THE Journal OF THE AMERICAN DENTAL ASSOCIATION

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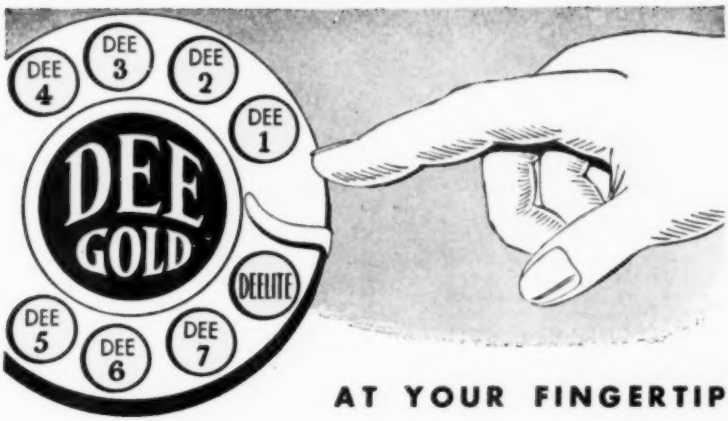

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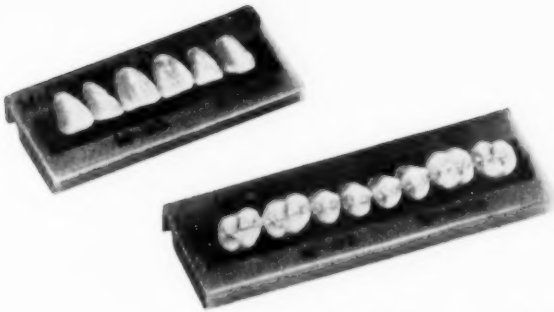

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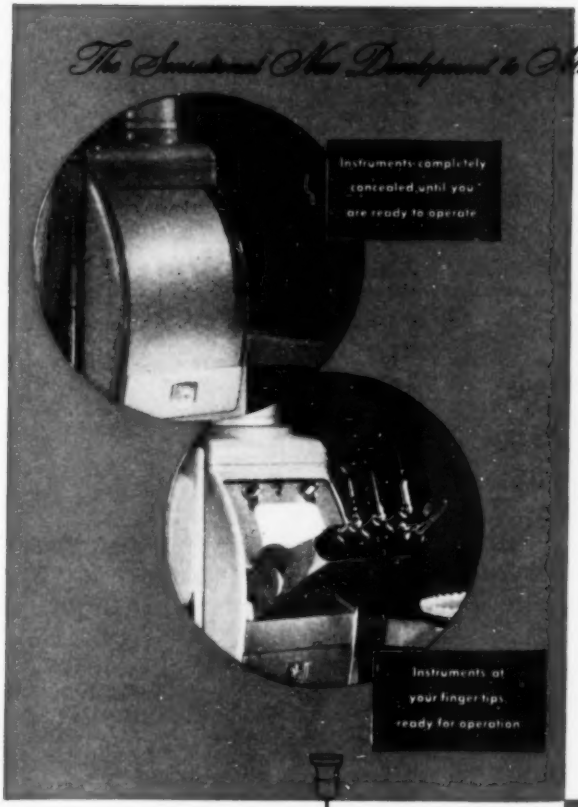

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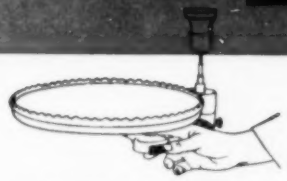

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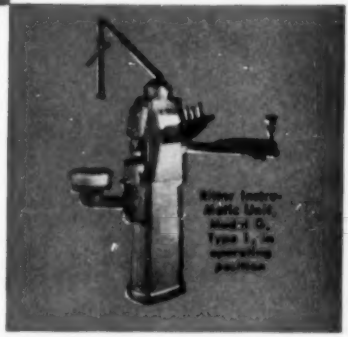

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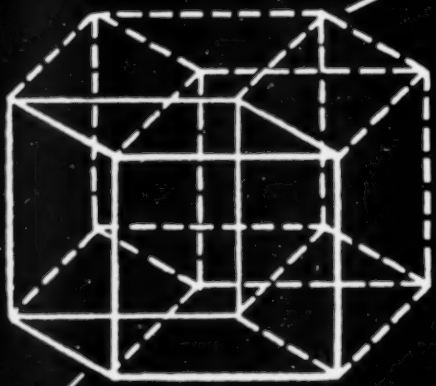

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†*Bragdon, C.: A Primer of Higher Space, New York, Alfred A. Knopf, 1923, Plate 1.*

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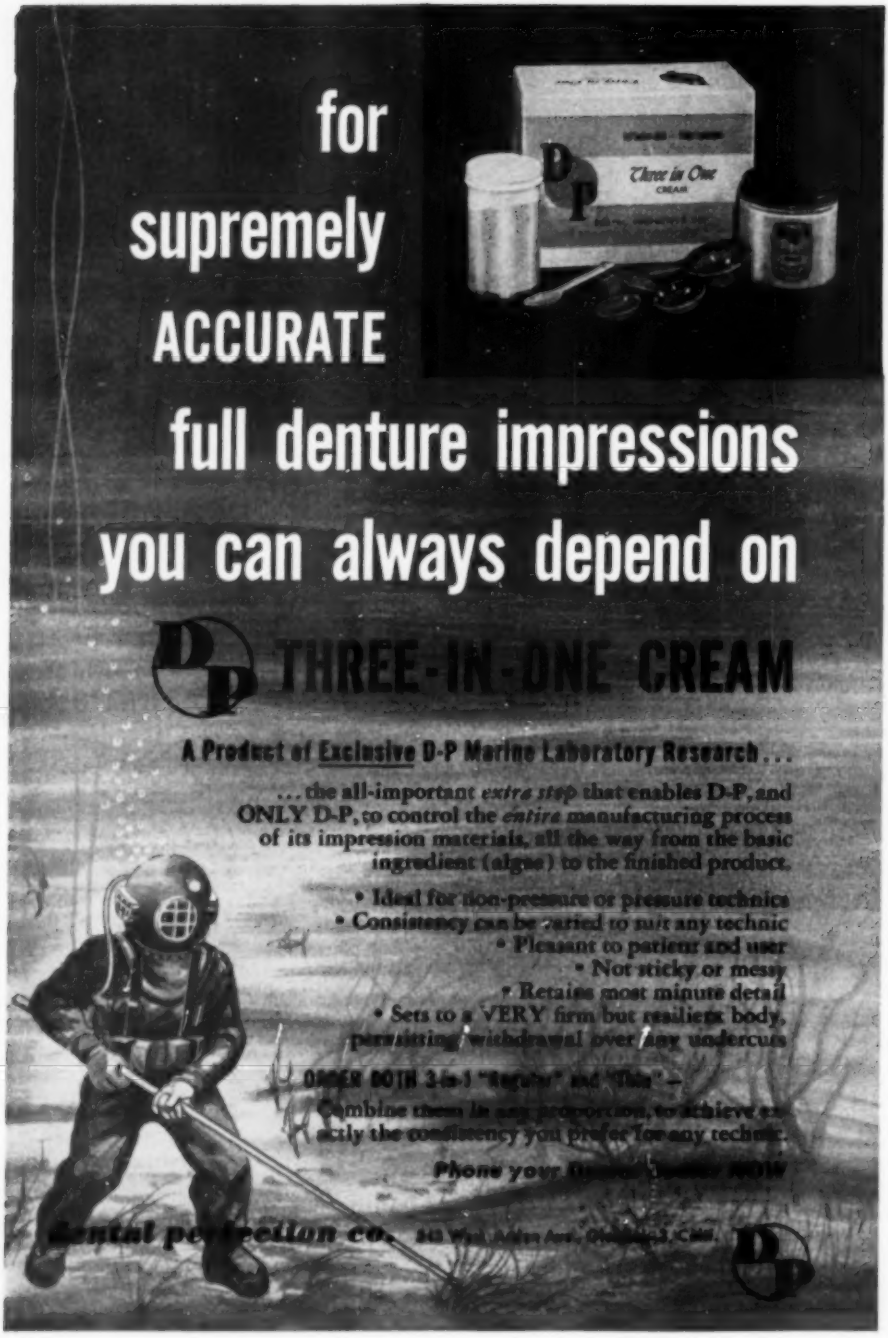
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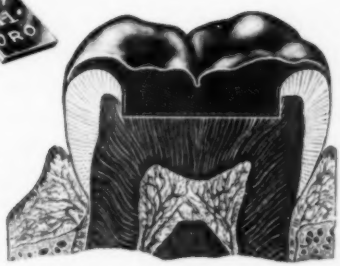

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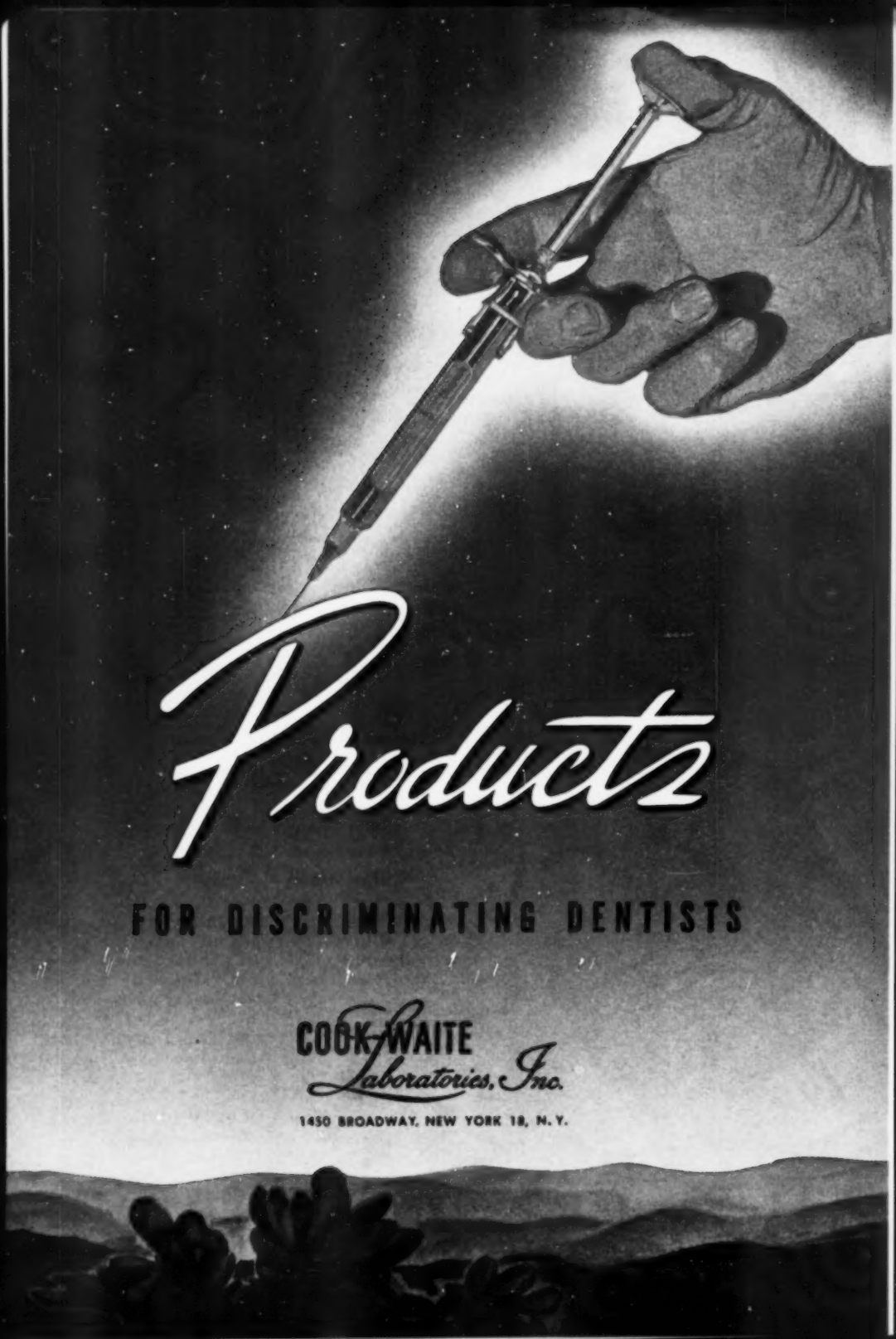
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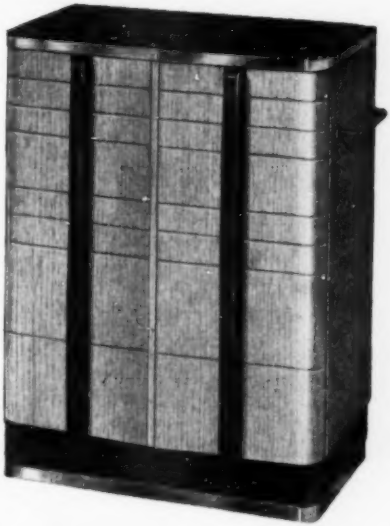

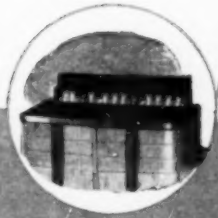

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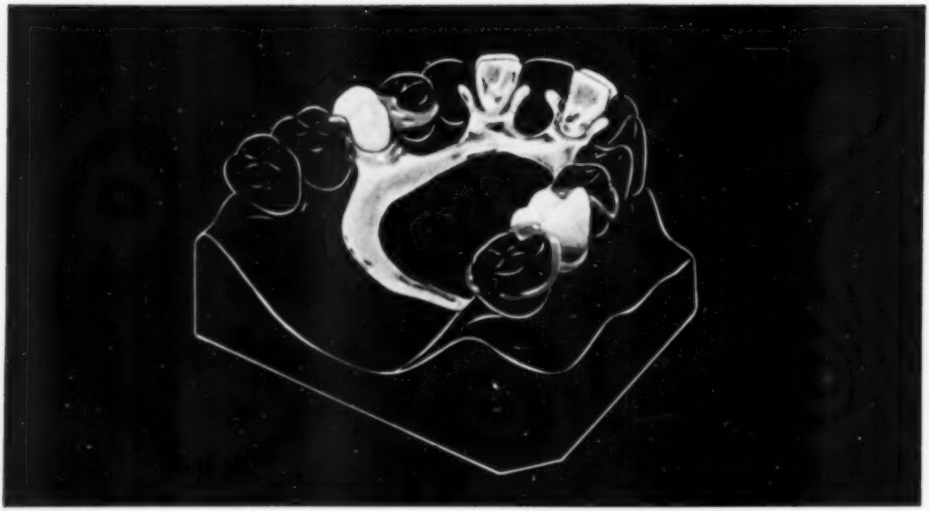

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NOVEMBER 1953 VOLUME 47 • NUMBER 5

OF THE AMERICAN DENTAL ASSOCIATION

Dental manpower mobilization and the cold war

Howard A. Rusk, M.D., Washington, D. C.

In June of this year, the Congress passed, and the President signed, a bill which extended the "professional" draft law for another two years until July 1, 1955. When the first law was passed, it contained a provision for a National Advisory Committee to Selective Service, and President Truman at that time appointed the same committee which was then serving as an Advisory Committee to the National Security Resources Board on all health matters. President Eisenhower reappointed this same Committee early this year, and it has continued to function in both capacities during this period of time. It has been a privilege to chair such a distinguished and hard-working Committee. The members are: Dr. Francis J. Braceland, director of the Institute of Living, Hartford, Connecticut; Dr. Edwin L. Crosby, director of the Joint Commission for the Accreditation of Hospitals, Chicago; Dr. Harold S. Diehl, dean of the medical sciences, University of Minnesota, Minneapolis; Dr. Alan Gregg, formerly vice-president of the Rockefeller Foundation, New York City; Dr. Leo J. Schoeny, consultant, Council on Federal Dental Services, American Dental Association, New Orleans, and Dr. William P. Shepard, vice-president, Metropolitan Life Insurance Company, New York City.

The Committee has met in Washington and held regional meetings throughout the United States for two days every second week. We have worked hard and long and faithfully in a job that often has been quite difficult—a job that would have been impossible had it not been for the total cooperation it has received from all interested groups, both governmental and voluntary. At this time I should like to express our gratitude to the American

Presented before the House of Delegates, ninety-fourth annual session, American Dental Association, Cleveland, October 1, 1953.

Chairman, Health Resources Advisory Committee, Office of Defense Mobilization.

Dental Association, its officers, and its members for the complete cooperation and assistance that have been given to us.

Today with the world's situation and the state of chronic stress and with no knowledge of when this stress will end, it is well to review the past and project the problems of the future.

GENERAL OUTLOOK

At the outbreak of war in Korea, in 1950, large numbers of men were called up for two years' service. In 1951, the need was much smaller. Thus, there was established a pattern of large call-ups in the even-numbered years, and smaller calls in the odd years. From now until next summer few dentists and almost no physicians will be called. Beginning in the late summer of 1954, however, we can expect a substantial call both for physicians and dentists.

RATIOS AND TROOP STRENGTH

During the last war, dentists were in military service at a ratio of approximately two dentists per 1,000 troop strength; physicians at a ratio of six per 1,000. Today the ratio of physicians is less than four per 1,000, with a planned ratio of 3.2 for next year. The ratio of dentists, however, is still at about the old level—it stands now at 1.9 per thousand. In this discussion, it will be assumed that the present dental ratio will stand, although there is serious question among the members of the Advisory Committee both as to its logic and its necessity. The American Dental Association is making studies at the present time on utilization that will be fundamental in consideration of this problem.

NUMBERS IN SERVICE

Unless mobilization is stepped up, the total number of dentists in service will show a slight drop by the end of next year. There are now some 6,800 dentists in service. If the total strength of the Armed Forces drops to 3,300,000 during the next year, as the Secretary of Defense has indicated, the total number of dentists in service should drop by about 600 by the fall of 1954.

ANALYSIS OF CALLS

Last spring there was considerable concern on the part of the American Dental Association and of our Committee, because calls for dentists were being made among those in Priority III, in the age group over 40. Fortunately, this situation lasted only a short time and few men from this group were called. The date of call for meeting the greater part of the need was postponed until July and August, when the 1953 graduates, many of whom were liable for service under the regular draft law, could be called.

The needs for the present year have been met to a large extent. The balance, we estimate, can come from the few dentists remaining in Priorities I and II, from the class of 1953, and from men under 40 in Priority III. No Selective Service calls for dentists are planned before next July. Thereafter, however, the picture will be different. The graduates of 1954 who will be available for service (that is, who will be classified in Priority III and who will be physically qualified) will probably number less than 1,500. The real brunt of the 1954 call will fall on dentists in Priority III who are over 40 years old.

We do not expect the same situation among physicians. Even in 1954, presently planned calls probably can be met without going over the age of 40.

The reasons for these differences are complex. First, the requirements of the Armed Forces call for a larger proportion of the total supply of dentists than of physicians. At the present time, 7.3 per cent of all living dentists are on active military duty, but only 6.3 per cent

of the physicians. This over-all difference is accentuated by the differences in priority and age distribution of dentists and physicians.

Proportionately fewer dentists than physicians were classified in Priorities I and II. This is true primarily because the Armed Forces terminated their war-time training program for dental students earlier than their medical training program. Because of this cut-off of the military training program for dentists, there was a sharp drop in the number of dental school graduates in 1947, 1948 and 1949, years from which Priorities I and II are primarily drawn. The number of medical graduates, however, remained high in those years.

Second, proportionately fewer dentists than physicians are in Priority III, in the age group under 40 (5 per cent of physicians in contrast to less than 3 per cent of the dentists). This difference reflects the fact that in total, proportionately fewer dentists are in their thirties—a result primarily of the low enrollment rates in dental schools during the depression years.

Twenty-nine per cent of all physicians, but only 23 per cent of the dentists, are in the age group 30 to 39. There also are proportionately more physicians in their forties. But there are proportionately more dentists in their fifties and sixties.

Altogether, these differences in priority and age distribution obviously bear an important relation to the impact of the draft law on the dental profession. They mean that present dentist-troop ratios can be maintained only by a heavy call, next year, on dentists in the 40-plus age group.

If there were to be full mobilization, it would be necessary to go into Priority IV in the case of both professions. Again, the dentists in Priority IV would be reached first and it would be necessary to call those who already have had considerable military service.

No matter how the problem is viewed, meeting military requirements places, and will continue to place, a heavy strain on the dental profession.

It must be remembered, in considering these figures, that the fact that a man is in Priority I or II does not guarantee that he will be called into military service. Of the 5,039 dentists in the first two priorities, according to the most recent report from Selective Service, 3,673 (73 per cent) are now commissioned, in service, or have completed service. Another 284 (6 per cent) are classified 1-A, while 101 (2 per cent) have not yet been examined. However, 331 (6 per cent) are filling essential civilian positions—teaching, research, service in isolated areas, for example—and another 650 (13 per cent) do not meet military physical standards, and therefore cannot be called. The Committee has been cognizant of the special problems of teaching in the dental profession, and have given special consideration to the problem of Priority I and Priority II dentists who are dedicating themselves to professional teaching. This we shall continue to do. In total, then, only about 80 per cent of the men in these priority groups will see military service.

NEED OF THE ARMED FORCES

The determination of standards of need for health services is perhaps easier for military than for civilian life, since in military service the economic and the cultural barriers to adequate care are in large measure removed. In terms of the potential utilization of service, the present dental military standard of 1 to 500 probably is not excessive, in view of the cumulated dental neglect to be found in the mouth of the average draftee, and the biennial turnover of young men in military service.

In terms of the available supply of dentists, however, the military utilization rate is high. In relation to supply, the military services make more liberal

Table • Utilization of dentists

	Rate per 1,000 population*		Ratio of military to civilian use
	Military	Civilian	
Dentists	1.9	0.5	3.8
Physicians	3.7	1.3	2.8
Nurses	3.1	2.2	1.4

*Active practitioners only.

use of dentists than of physicians or nurses. The military services have, proportionately, almost four times as many dentists as does the civilian population, in contrast to not quite three times as many physicians and one and a half times as many nurses. (The ratios are shown in the table.)

THE FUTURE SUPPLY OF DENTISTS

The number of dentists in the United States has increased since 1940 at about the same rate as the population.

The present outlook, assuming that there will be about 3,000 graduates a year, is for about 100,000 dentists in 1960, of whom some 90,000 can be expected to be in active practice.

The considerable increase in the number of dentists entering the profession each year is noteworthy, but is not, and cannot in the near future, be enough to provide significant increases in the amounts of service available.

It will provide a continuance of present dentist-population ratios, but almost no improvement.

From the military point of view, this increased output will ease the situation, since there will be more young men who can be called into service. But for the civilian population the situation will be, if anything, more difficult since an increasing proportion of civilian service must come from the older men, who, in general, do not carry as heavy patient loads.

UTILIZATION

This brings up another area of concern. Throughout the health professions, personnel shortages are acute. The solution of the resultant problems can be reached only after an acceptance by members of the health professions of the fact that there are and will continue to be shortages. There must be continuing study of personnel utilization to assure that professional and technical skills are put to best use. We may well be faced with a national emergency unless steps are taken to make better use of professional skills, and to recruit, train and utilize auxiliary workers.

The effective use of auxiliary dental personnel is an important part of this whole problem. A study made by the American Dental Association in 1950 showed that the number of patients seen by a dentist who employs a dental hygienist or a dental assistant is markedly greater than by a dentist with no such assistant.

A similar problem, and an even more acute one, is the nursing shortage and the utilization of other ancillary personnel in hospitals. The Committee has turned its attention to this particular problem and has appointed a special Subcommittee on the Utilization of Hospital Personnel composed of distinguished hospital administrators, nurses, and others who are deeply interested in this problem. A brochure has been published which is now in its second printing and has been distributed to all hospitals, chiefs of staff, heads of nursing service and others interested. The preliminary findings have received enthusiastic attention, and we are hopeful that the studies of this Subcommittee may do much to alleviate this critical situation.

The potential gain in service which is possible with such help cannot be fully realized, however, until more dentists recognize the advantages to be gained, and until more such auxiliary workers are

available. The undergraduate education of dentists, it would seem, should include orientation and practice leading to such an understanding. Likewise, there is a real challenge to the profession in the need for leadership in the development of training standards and facilities for auxiliary dental workers, and in the need for active recruitment in these important fields.

SUMMARY

The mobilization program brings into focus three problems related to the limited supply of dental personnel. First, the need for review of military requirements in relation to the supply from which such requirements can be met; second, the problem of maintaining training facilities at the highest level of enrollment compatible with good training; and third, the best possible utilization of the present short supply of dentists. This is not a problem of the Armed Forces or the Advisory Committee alone. It can be solved only by the complete cooperation of the dental profession and the educator, and an understanding by the consumer of this fundamental service of the patient. We are grateful for your cooperation and help in the past and look forward to even a closer association in the future.

The Role of Education in Matters of Health • It can safely be said that in the future more and more emphasis will be given to education as a means of achieving health goals. Several conditions account for this shift in interest.

Among the conditions that cause the greatest interference with our physical, mental and social well-being today are those that are not susceptible to control except through the action of each individual. For example, the chronic diseases are our greatest cripplers and killers today, and with minor exceptions, the best we can do about it, in the light of our present knowledge is to find the disease early and to initiate treatment as a means of preventing further damage. Stimulating people to be aware of the possibilities of chronic disease and to take action early requires education. *Hayhew Derryberry, Health Education in Public Health Views, West Virginia State Department of Health 2:1 July 1951.*

Pulp management in the mixed dentition

Irving W. Eichenbaum, D.D.S., and Naomi A. Dunn, D.D.S., New Britain, Conn.

The conservation of the deciduous dentition is undoubtedly a prerequisite of any progressive dental service today. Students of research and practitioners have demonstrated the need for a normal sequence of retention and loss of these teeth, and have stressed the decisive role they play in the physical alignment of the permanent successors. The orthodontist[1] in particular has shown his awareness of this situation by urging that a close watch be kept on all areas where deciduous teeth have been prematurely lost. Early[2] loss of a deciduous molar may allow the teeth mesial and distal to this area to drift into the space. This would leave insufficient room for the succeeding bicuspid and would set the stage for a developing malocclusion.

Conservation of the deciduous dentition is of interest, not only as it relates to preventive orthodontics, but as it concerns the whole child. Today more than the oral cavity must be considered; the entire patient must be treated. The child who has an assortment of broken-down, chronically infected teeth is of necessity a poor eater. Each mouthful of food is improperly masticated, if masticated at all, and is swallowed as quickly as possible. Often food which necessitates any chewing is refused and a softer diet is substituted. This deficiency of diet may lead to a nutritional imbalance and to a child who is subclinically ill, chronically in need of dietary supplements and one who is never quite physically normal. Any attempt at a program of routine or even infrequent toothbrushing will, of course, be a failure. Thus, the evil effects of an inadequate dentition are not limited to the oral cavity, but may be demonstrated elsewhere within the child. These are two of the most compelling reasons why dental practitioners should make a routine procedure of pulp therapy in the teeth of the young child. A significant number[3] of young children come to the dental office who are in need of conservative pulp therapy. Carious exposures of the pulp (Fig. 1) account for the greater number of these and traumatic incidents the rest. Any dentist accepting and treating these children must be ready to institute measures to retain these deciduous teeth either in a vital or nonvital state.

Operations on the dental pulp have been removed from the speculative field and represent conservative procedure. Zander and Law[4] initiated a new method of pulp therapy with their demonstration of pulp healing and regeneration under calcium hydroxide medication.

1. Year book of dentistry, 1950. Chicago, Year Book Publishers, 1950, p. 234.

2. Brauer, J. C., and others. Dentistry for children, ed. 3. New York, Blakiston Co., 1952, p. 361.

3. Eichenbaum, I. W., and Dunn, N. A. Prevalence of pulpally involved primary teeth. J. Den. Children 18:8, 4th quart. 1951.

4. Zander, H. A., and Law, D. B. Pulp management in fractures of young permanent teeth. J.A.D.A. 29:737 May 1942.

Aisenberg[5] in 1945 and Berk[6] in 1951 furthered the cause of pulp conservation by their penetrating studies on the histological findings of the reaction of pulp tissue to calcium hydroxide therapy. Today successful surgical manipulation of the pulp tissue can be regarded as a routine procedure. It is the purpose of this paper to provide a logical plan of treatment for the pulp tissue in the deciduous and early permanent dentition.

A formidable barrier to the employment of a proper technic[2] is the noncooperative child. As all pulpal procedures are performed under a rubber dam in a sterile field of operation, the patient must be receptive and cooperative at all times. Unfortunately, a number of young patients are inclined to be behavior problems in the dental office. Most likely they have had previous dental discomfort and are unwilling patients at this time. The proper conditioning and preparation of this young patient for the anesthetic and for the rubber dam will go a long way toward removing the fear of the actual procedures which follow. Since long appointments may cause uneasiness and apprehension, tending to break down the best behaved children, premedication is frequently used. Secobarbital sodium,[7] in sedative doses, is administered approximately 45 minutes preoperatively. In the extremely young or apprehensive patient, the elimination of food for four hours preoperatively is usually a wise precaution. Nausea is an infrequent, though troublesome, occurrence when the rubber dam is applied.

The anesthetic of choice is procaine hydrochloride and several simple precautions will ensure a calm appointment. The syringe always should have a sharp needle, preferably 28 gauge, and the apparatus should be kept from the child's view. The actual insertion of the needle is in a sterile area which has been previously painted with a topical anesthetic. The release of the drug is slow and precedes the course of the needle in the tissues. No doubt many technics exist for the painless use of the hypodermic syringe, but all of them require the employment of a thin, sharp needle.

Fig. 1 • Lower deciduous molar which is a poor risk for endodontic procedures. Infection has progressed into the periapical region. Tooth should be removed and space retainer placed

The deciduous teeth most frequently in need of pulp therapy are the molars and these may be treated with the teeth in a vital state or after devitalization. The authors employ a technic keeping the tooth vital if the exposure is instrumental or not extensive and there is no history of previous pain. Where there is a history of minimal pain, and the pulp is exposed with caries still present, the technic of nonvital pulpotomy is preferred.

VITAL PULPOTOMY

The molar to be treated is anesthetized and placed under a rubber dam. The area is painted with tincture of nitropersol, and using a no. 701 fissure bur the entire occlusal surface is removed as though in the preparation of a Class I cavity. Care is taken to remove the debris as the operation progresses. Then a no.

5. Aisenberg, M. S. Results of partial pulpectomy. J.A.D.A. 30:40 Jan. 1943.

6. Berk, H. Effect of calcium hydroxide-methyl cellulose paste on the dental pulp. J. Den. Children 17:65, 4th quart. 1950.

7. Krupicka, J. W. Use of sodium seconal for the nervous child patient. J. Den. Children 18:20, 4th quart. 1951.

700 bur is used to circumscribe the roof of the pulp chamber which will easily lift out with a small excavator. This should expose the coronal portion of the pulp tissue which is removed with the largest spoon excavator to fit the particular region. The instrument is carried well down to the floor of the chamber and down onto each root canal. The hemorrhage is controlled with a small amount of pressure applied with sterile cotton pellets. Generally an effort is made to avoid the application of hemostatic drugs to the severed pulp stumps and simple pressure will suffice to control any bleeding. After clotting has occurred a thin layer of calcium hydroxide is placed gently over the pulp tissue in the root canals. This is covered with a thin mix of cement and finally with the permanent restoration (Fig. 2).

The advantages of this technic are:

1. The entire operation is completed in one sitting.
2. The vitality remains unimpaired.
3. There is histological repair of the pulp.

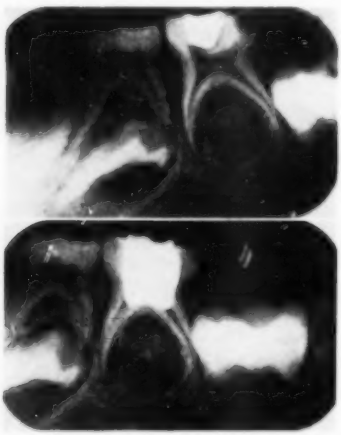

Fig. 2 • Above: Lower deciduous molar with carious exposure. Below: Eight months after vital pulpotomy. Depth of excavation for pulp tissue removal is shown

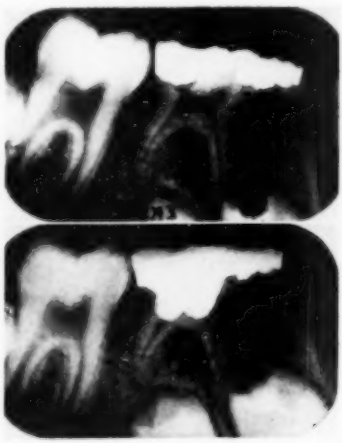

Fig. 3 • Above: Initial stage of nonvital pulpotomy showing devitalizing compound in position under a cement seal. Material is in contact with pulp tissue. Below: Final phase of pulpotomy with permanent restoration inserted. Time interval between films is 14 months

The disadvantages are:

1. A local anesthetic must be administered.
2. Pulp hemorrhage must be controlled.

NONVITAL PULPOTOMY

The technic for a nonvital pulpotomy is an operation which requires two sittings. No anesthetic is needed. The tooth is isolated with cotton rolls and dried thoroughly. A small amount of paraformaldehyde[8] compound is placed directly over the open exposure (Fig. 3) being certain that no pressure is used which may cause this material to become dislodged or be forced into the pulp chamber. A thin mix of cement is flowed over this in such a manner as to completely seal the cavity from oral fluids and to prevent any escape of gas. The

8. Brauer, J. G., and others. Dentistry for children, ed. 2. New York, Blakiston Co., 1947, p. 331.

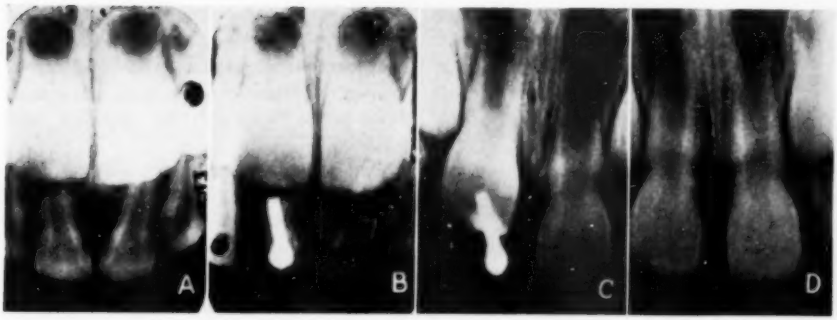

Fig. 4 • A: Devitalized deciduous incisor in three and a half year old patient. B: Six months after pulpectomy. C: Incisor two years later. Resorption of root is shown; gutta-percha point was well tolerated by tissues. View taken just prior to exfoliation. D: Permanent incisors in normal position three years after devitalization of deciduous tooth

paraformaldehyde compound will slowly liberate formaldehyde gas in such a manner as to devitalize the contents of the pulp chamber.

The second operation, two weeks later, must be performed under a rubber dam and in a sterile field of operation. The occlusal portion of the tooth is opened wide and the coronal contents of the pulp chamber are removed. The chamber is cleansed with phenol and dried with cotton pellets and a mix of zinc oxide and eugenol or a paraformaldehyde paste[8] is placed directly over the root canals. A cement base is placed over this and then the permanent restoration. Occasionally sensation may be present when an attempt is made to enter the pulp chamber. This may be caused by a lack of a good cement seal which allows saliva to contaminate and dilute the paraformaldehyde compound, or the material itself may be therapeutically ineffective. In the first instance, the cavity is resealed with a new application of wax for one additional week. In the second instance new drugs are used in the formula which is applied and allowed to remain for an additional week. The advantages of this technic are that no anesthetic is required and there is no bleeding to control. The disadvantages are that two visits are necessary and the tooth is nonvital.

PULPECTOMY IN DECIDUOUS INCISORS

The premature loss of the deciduous incisors is not an unusual occurrence.[9] These losses generally are due to devitalization of the tooth which had resulted from traumatic incidents (Fig. 4). Most orthodontists[10] agree that space maintenance in these instances is not necessary; however, there is increasing evidence that speech difficulties may arise. Continued observation of children with missing incisors reveals a significant number of speech habits that had not been encountered previously in these children. There is a tendency to thrust the tongue into the space or to place a pencil or crayon therein. Also speech is affected by emphasis on the sibulant sounds. As a full complement of teeth is basically an ideal objective, every effort should be made to retain dental structures, provided that they do not jeopardize the general health and welfare of the child. If the dental

9. Ellertson, C. H. Traumatized non-vital anterior primary tooth. J. California D.A. 27:193 July-Aug. 1951.
10. Wilbur, H. M. Management of injured teeth. J.A.D.A. 44:1 Jan. 1952.

practitioner makes no definitive attempt to retain these teeth the parent may question efforts to retain others. An effort has been made to prepare a simple, logical plan for pulpectomy in these deciduous incisor teeth.

The tooth or teeth in question are placed under the rubber dam and the area is sterilized with iodine or nitromersol. The contents of the root canal and pulp chamber are removed carefully, the operator making certain that the instrument does not project into periapical tissues. Sterile cotton absorbent points are placed in the canal to aid in the removal of necrotic matter.

Any one of several antibiotic compounds can be used to sterilize the root canal. Grossman[11] has experimented for several years, with excellent results, using his formula which contains penicillin, bacitracin, streptomycin and sodium caprylate. This formula provides a chemically balanced combination of drugs designed to provide the greatest efficiency for the destruction of gram negative and gram positive organisms and certain yeasts and fungi. Further clinically effective work with antibiotics has been reported by Bender and Seltzer.[12]

A small amount of antibiotic compound is inserted into the root canal and placed in contact with the lateral walls. This is sealed in with double seal of gutta-percha and cement. The treatment is repeated once and on the third visit the canal is filled with gutta-percha points in the usual manner. Extreme care is exercised not to invade periapical tissues.

The gutta-percha point is well tolerated by the tissues after the normal resorption of the root has begun. The authors' experience has extended over 27 cases covering a period of 38 months. Fourteen cases are in progress at the time of writing and there is no clinical or roentgenographic evidence of pathologic disturbances. Seven patients have exfoliated their teeth at a normal time and the succeeding central incisors are in position. In six instances there was periapical involvement and the teeth were removed soon after the operation. More study and observation in this field is needed before any conclusion may be advanced.

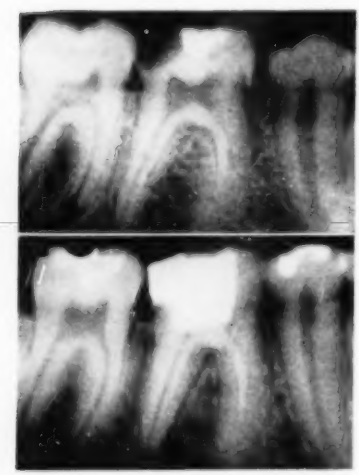

Fig. 5 • Above: Carious exposure in lower first permanent molar in patient aged 11. Below: Three years after a vital pulpotomy had been performed using calcium hydroxide

PERMANENT DENTITION

The need for retention of the first permanent molars is placed in sharper focus when the havoc wrought by the premature loss of one or more of these teeth is witnessed. A series of dental ills when the individual has reached the age of 30 can be attributed to the loss of several permanent teeth at age 15. These teeth, the sixth-year molars, are a fundamental requisite to a normally developing dentition, and certainly their loss would tend

11. Grossman, L. I. Polyantibiotic treatment of pulpless teeth. J.A.D.A. 43:265 Sept. 1951.

12. Bender, I. B., and Seltzer, S. Combination of antibiotics and fungicides used in treatment of infected pulpless tooth. J.A.D.A. 45:293 Sept. 1952.

to cause abnormal occlusion. Salzmann[13] has spent much time studying the problems presented by the loss of the first permanent molars and states:

> The harmful effects following extractions of first permanent molars are well defined in adolescent boys and girls nearing the final stages of growth and development. The effects of first molar extraction are manifested in the increase in caries, occlusal disturbances and changes in facial contour and appearance and frequently in interference in the speech and general physical growth and development.

The treatment of pulp exposures resulting from instrumentation in the first molars is conservative in all instances; that is, pulp capping[1] or pulpotomy. In both instances an effort is made to retain the vitality of the tooth in question. In the minute exposure where a pulp horn is encountered, the operator may choose to cap the exposure with calcium hydroxide. The tooth is isolated and washed with sterile water and gently dried. The capping paste is placed directly over the site of exposure, an effort being made to avoid forcing any material into the pulp. A thin mix of cement is placed over this and allowed to harden; this is to prevent the transmission of any packing pressure to the pulp tissues. At this point the tooth is ready for the restoration. The degree of success with this technic is[14] less than with the pulpotomy, but where economic factors prohibit the performing of several pulpotomies it is far better to attempt careful capping procedures than to take no definitive steps to preserve these teeth.

The pulpotomy performed on permanent teeth (Fig. 5) is designed to be completed in one sitting and requires a sterile field of operation under a rubber dam. The dental pulp is anesthetized. The method has been described previously. The results have been so gratifying (Fig. 6) that it is well worth the effort

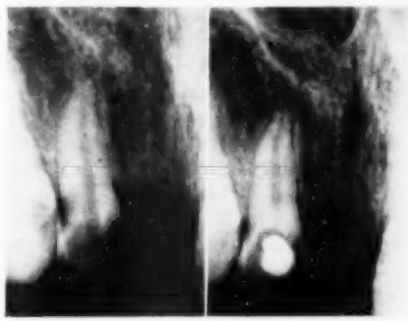

Fig. 7 • Accidental impact carried away about two thirds of clinical crown of this lateral incisor, exposing pulp. Patient was treated within 24 hours by a vital pulpotomy. Tooth is vital today and will serve as one abutment for anterior fixed bridge to replace the missing central incisor. Secondary dentin can be seen apical to cement restoration

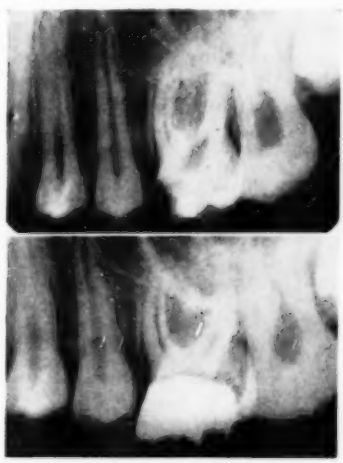

Fig. 6 • Above: Carious exposure in upper first permanent molar in patient aged 13. Below: Eighteen months after vital pulpotomy had been performed using calcium hydroxide with cement as a base for a large alloy restoration

13. Lamons, F. F. Pedodontics and orthodontics: a combination practice. J.A.D.A. 36:56 Jan. 1948.

14. Year book of dentistry, 1950. Chicago, Year Book Publishers, 1950, p. 205.

involved. The complete dental health service for the child demands thorough exploration of every proved method for maintaining the dental structures.

The tragic effects of traumatic injuries (Fig. 7) to the anterior teeth has received much attention from dental researchers and authors. Ellis[15] in 1945 dealt with all types of injuries to these teeth and presented a logical plan of treatment for the conservation of these teeth. Whereas the loss of posterior teeth presents physiological problems, the loss of an incisor may cause a psychological shock to the child which is difficult to surmount. Every practitioner has seen an adolescent in his office making an effort to conceal a discolored or fractured incisor with the lip. This youngster may even adopt the mechanism of placing the hand over the mouth when talking or smiling to aid in the deception.

The treatment of fractured anterior teeth generally falls into two groups. One group usually has suffered a minor loss of tooth tissue and these teeth need protection from thermal or masticatory stimuli. A periodic roentgenographic survey and a constant awareness that even a minor blow can cause death of the pulp go hand in hand in the care of these teeth. The electric pulp tester must be employed to aid in the proper evaluation of the recovery process.

The second group of traumatized anterior teeth are those where death of the pulp is a sequel to the accident. The degeneration of pulp tissue may occur soon after the accident or may follow many months later (Fig. 8). The preservation of these teeth may tax the ingenuity and skill of the most patient practitioner (Fig. 9). There are two recognized courses of treatment which may be used after the pulp tissue has degenerated to ensure the retention of these teeth—the pulpectomy and the root resection. Of primary importance in the diagnosis is a thorough roentgenographic examination. The anatomic aberrations found in root canals determine which course should be followed. The requisites for a pulpectomy are basically (1) a fully formed, or nearly so, root apex; (2) absence of lateral canals or a minimum of apical ramifications; (3) accessibility.

One of the most frequent causes of failure in root canal treatment is the inability of the operator to remove all the necrotic pulp tissue[16] from lateral canals or apical ramifications. Kronfeld[17] reproduces a chart by Hess showing aberrations in root canals averaging from 18 per cent in the cuspids to 31 per cent in the lateral incisors. It would appear that anatomic considerations would tend to reduce the degree of success. Fortunately, newer methods in endodontic procedure help to overcome these obstacles. Grossman[10] has demonstrated remarkable success in sterilization of infected root canals with a polyantibiotic formula. This new aid in endodontic therapy has been proved both clinically and in the laboratory.

A further obstacle to successful root canal therapy in the young is the presence of the wide-open root apex. It is difficult to properly condense a root canal filling and limit it to the confines of the root canal. One method of meeting the requirements of proper condensation of filling material, elimination of anatomic deviations and the sealing of the apex is by root resection in conjunction with the root canal filling (Fig. 10).

There are several advantages in this technic over that of the pulpectomy. They are:

1. The elimination of lateral canals.
2. A densely packed and controlled root canal filling.

15. Ellis, R. G. Classification and treatment of injuries to the teeth of children, ed. 2. Chicago, Year Book Publishers, 1946.

16. Ostrander, F. D. Some fundamentals of successful endodontic practice. J.A.D.A. 42:129 Feb. 1951.

17. Kronfeld, R. Histopathology of the teeth and their surrounding structures. Philadelphia, Lea & Febiger, 1933, p. 183, 200.

3. The resection and root canal filling are completed in one visit.

Kronfeld[17] has noted that:

> Clinically it is well known that large areas of bone destruction around the apex of an infected pulpless tooth may heal completely after the root end has been resected and the pulp canal filled. Several cases of this type were examined microscopically. All these clinically successful cases showed a normal uninflamed periodontal membrane and deposition of cementum upon the resected dentin surface.

An example of complete histologic repair of a central incisor after root resection is shown in Figure 11.

Obviously all pulpless, infected teeth cannot and should not be subjected to routine root amputation. This would be needless exposure of the patient to

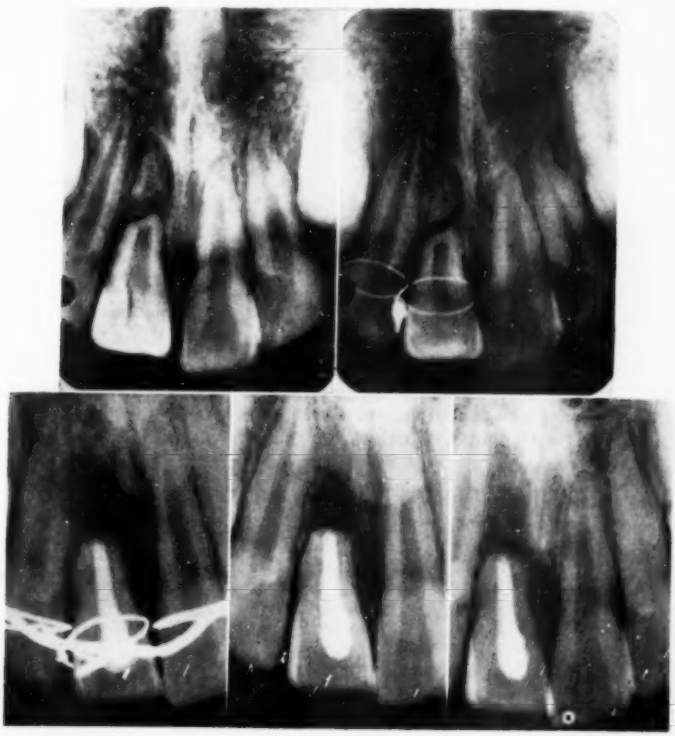

Fig. 8 • Automobile accident fractured this central incisor and displaced it lingually 6 mm. It was wired into position to prevent accidental displacement. Retention of this tooth was imperative since child had speech defect and loss of the tooth necessitating a prosthetic replacement would be a severe psychological hindrance. Films taken at ten week intervals demonstrating root resection and the splint placed to immobilize tooth. Splint removed in three months—mobility greatly reduced. Periapical repair seems well in progress. Last film was taken eight months after root resection. Amount of root retained is far too small for most root resection; however, the parents of the patient urged retention of this tooth

Right: Central incisor five days after root resection with splint in position. A small amount of incisal disking was necessary when tooth was brought labially to its former position

Fig. 9 • Left: Preoperative view of case shown in Figure 8. Note severe lingual displacement

surgical experiences; however, there are instances where root amputation is the conservative course[18] and the most logical procedure. Figure 12 shows an example of where a technic which includes root resection may prove beneficial. The root apex is wide open, and in this case a considerable number of root canal treatments would be needed to produce a negative culture. Also, it would be exceedingly difficult to produce a well condensed root canal filling and not invade the periapical region. As in all pedodontic practice, the welfare of the entire child is of prime consideration before the technic is chosen. The temperament, general health and cooperation of the child, in addition to the mental attitude of the parent, will aid materially in this choice.

SUMMARY

Several technics for pulpotomy in the deciduous dentition have been discussed. The methods, one using calcium hydrox-

18. Blum, T. Life span of teeth whose roots have been resected. New York J. Den. 15:60 Feb. 1945.

Fig. 10 • Serial roentgenograms taken one month apart showing repair of severe defect in maxilla as a result of cyst removal and root resection

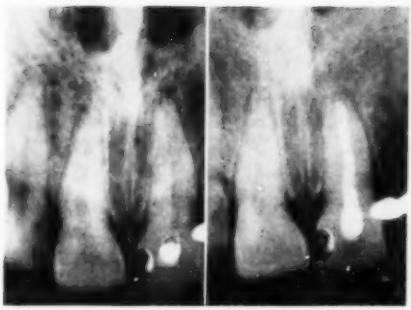

Fig. 11 • Preoperative and postoperative roentgenogram of root resection in central incisor and complete histologic repair. Time interval between films is one year.

Fig. 12 • Traumatized and nonvital central incisor which would be difficult to treat with a technic which did not include root resection.

ide in a vital pulpotomy and the parafoldmaldehyde paste in a nonvital pulpotomy, are designed to retain the deciduous teeth for their normal period of time. In the permanent teeth, the vital pulpotomy is used exclusively since the retention of vitality is to be desired. An effort should be made to retain nonvital deciduous anterior teeth since their early loss may predispose to deleterious speech habits.

CONCLUSION

The primary purpose of a logical plan of treatment for pulp conservation is the retention of deciduous teeth until such time as they are normally exfoliated. There are many instances where the practitioner must enter the pulp chamber and he must treat this dental tissue in such a manner as to prevent infection and to permit normal growth and development of the teeth. The permanent teeth must be retained in order to prevent many of the ills which follow their loss. It is during the period of the mixed dentition that technics for pulp conservation are needed most, and they should be judiciously applied.

24 Washington Street

Application of Medical Science • The history of medicine . . . is infinitely more than the history of the great doctors and their books. Medical science is important, but is wasted unless its findings are applied on a large scale. We should have a completely wrong picture of French medicine in the early nineteenth century if we limited our studies to the great accomplishments of a few clinicians of genius in some Paris hospitals. We must also try to find out what medical services the peasant in the village, the coal miner in the factory town, the mill-worker in the suburb of the cities received at that time. ***Henry E. Sigerist, "A History of Medicine," 1951, Vol. 1, p. 14.***

Direct and indirect filling resins: a review of some physical and chemical properties

George C. Paffenbarger, D.D.S.; Robert J. Nelsen,* D.D.S., and W. T. Sweeney,† A.B., Washington, D. C.*

The utilization of synthetic resins in dental health service depends on a variety of properties with specific applications in each of the various specialties of dentistry. The direct and indirect filling resins in particular are becoming increasingly useful in dental procedures. The direct filling resins are those that are introduced into the cavity in a plastic state and harden or polymerize there. The indirect filling resins are polymerized in molds formed by the disappearing-wax-pattern process—similar to the process used in making cast inlays—and are then cemented into place.

The value of these resins, as of all filling materials, depends on the following factors:

1. Amount of dimensional change and warpage during hardening and in contact with the mouth environment.
2. Esthetic properties.
3. Chemical effects in the mouth.
4. Mechanical properties.

As yet there is no one filling material that meets all the ideal requirements in all situations. Analysis of the qualities of the direct and indirect filling resins—essentially polymethyl methacrylate—shows that they are faulty according to ideal requirements for factors 1 and 4 and fulfill excellently the ideal requirements for factors 2 (when resin is new) and 3.

DIMENSIONAL CHANGES IN RESINS

Polymerization Shrinkage • With few exceptions, materials shrink as they change from a fluid to a solid state. Unfortunately polymethyl methacrylate is not one of the exceptions. When the monomer is polymerized, a shrinkage of approximately 21 per cent by volume occurs. This shrinkage can be calculated easily by comparing the densities of the monomer (0.93 Gm. per cubic centimeter) and polymer (1.18 Gm. per cubic centimeter). The amount of shrinkage of the monomer-polymer mixture used in dental restorations depends, therefore, on the amount of monomer present. The result is the same for either the direct or the indirect resins. For example, if 0.25 Gm. of polymer is mixed with 0.25 ml. of monomer, the shrinkage of the resulting dough is over 11.4 per cent by volume. If the proportions are 0.50 Gm. of polymer to 0.25 ml. of monomer, the shrinkage is 7.8 per cent. The presence of air was disregarded in these calcula-

Presented as part of "Symposium: Present Status of Acrylic Resins for Restorations on Individual Teeth" before the Section on Operative Dentistry, ninety-fourth annual session, American Dental Association, Cleveland, September 28, 1953.

*Research associate, American Dental Association, National Bureau of Standards.

†Chief, Dental Research Section, National Bureau of Standards.

tions. The shrinkages determined for unrestricted specimens with comparable monomer-polymer ratios checked reasonably well with the predicted shrinkages.[1-3]

The shrinkage that occurs during the polymerization of methyl methacrylate monomer cannot be suppressed or lessened, because the rearrangement of the molecules of the monomer to form the more complex molecules of the polymer requires less space. This rearrangement is likewise independent of the method of inducing the polymerization; consequently, it occurs in the polymerization of both the self-curing (direct) and heat-curing (indirect) types of resins used in dental operative procedures.

In practice the restoration does not shrink these calculated amounts for the following reasons:

1. There is always some of the monomer that does not polymerize.[4-7] As will be shown later, this incomplete polymerization has a plasticizing effect which changes the mechanical properties of the self-curing resins.[8] The heat-cured resins are likewise affected if the heating schedule is inadequate for proper polymerization.

2. Part of the polymerization occurs before the resin dough is placed in the cavity; that is, when the pressure-matrix technic is employed. When the brush-increment technic, also called the non-pressure technic,[9] is used, some or all of the polymerization that takes place in the first few increments may occur before the last increment is added.

Influence of Technic on Polymerization Shrinkage • Even though the shrinkage caused by polymerization cannot be suppressed or lessened, it can be made to concentrate in regions of the restoration where it will be least detrimental. For instance, the shrinkage can be forced to take place mostly on the floor of the cavity by the placement of rounded undercuts continuously around the walls of the cavity and by keeping the matrix strip unremittingly taut during the entire period of the initial polymerization.[10] What is even more desirable, the shrinkage can be concentrated on the open face of a restoration by the relative adherence of the resin to the various materials with which it is in contact. For example, it has been demonstrated that in the heat-curing type of resin the shrinkage occurs on the tin-foiled side of the mold and not on the plaster side, which was not tin-foiled.[11]

Christie[2] demonstrated that the volumetric shrinkage of the direct filling resins in a closed mold depended on the type of material which lined the mold because the resins were relatively adherent to glass or steel and practically nonadherent to polyethylene. The molds he used were so constructed that glass-steel, steel-polyethylene and polyethylene-polyethylene surfaces could be employed. Whenever the resin did not adhere to the surface of the mold, considerable shrinkage occurred at that surface of the resin specimen. Conversely, when

1. Paffenbarger, G. C.; Wolcott, R. B., and Smith, D. L. Direct resinous filling materials: an investigation of Vita filling. J.A.D.A. 42:560 May 1951.

2. Christie, D. R. Acrylic fillings—general comments and some experimental data. J. Canad. D. A. 17:427 Aug. 1951.

3. Smith, Denton L., and Schoonover, I. C. Direct filling resins: dimensional changes resulting from polymerization shrinkage and water sorption. J.A.D.A. 46:540 May 1953.

4. Bauer, W. Schnellmethode zur Bestimmung der Vollständigkeit der Polymerization von Methacrylaharzen. Kunststoffe 40:94 March 1950.

5. Taylor, P. B., and Frank, S. L. Low temperature polymerization of acrylic resins. J. D. Res. 29:486 Aug. 1950.

6. Nelsen, R. J.; Wolcott, R. B., and Paffenbarger, G. C. Fluid exchange at margins of dental restorations. J.A.D.A. 44:288 March 1952.

7. Kramer, I. R. H., and McLean, J. W. The response of the human pulp to self-polymerising acrylic restorations. Brit. D. J. 92:255 May 20, 1952; 92:281 June 3, 1952.

8. Sweeney, W. T.; Sheehan, W. D., and Yost, E. L. Direct filling resins: mechanical properties. To be published in J.A.D.A.

9. Nealon, F. H. Acrylic restorations: operative non-pressure procedure. New York J. Den. 22:201 May 1952.

10. Paffenbarger, George C. Direct resinous filling materials, current advances in dentistry. Chicago, University of Illinois, College of Dentistry, Telephone Extension Program, 1952-1953, p. 38.

11. Tuckfield, W. J., and Warner, H. K. Acrylic resins in dentistry. Part II. Their use for denture construction. Austral. J. Den. 47:1 March 1943.

the resin did adhere to the surface of the mold, that surface of the resin gave little or no evidence of shrinkage. In other words, the direction of the shrinkage depended on the adhesion of the resin to a particular surface. As Christie pointed out, if the adhesion of the resin to the matrix material is greater than to the dentin, the matrix is not suitable. What is desirable is a matrix strip for which the resin has little or no adhesion so that the shrinkage will occur on the surface of the restoration in contact with the matrix strip. This is the optimum surface for the shrinkage. The relative adherence of the various resins and the various matrix materials needs to be determined.

The nonpressure technic advocated by Nealon,[9] wherein the resin is added in small increments with a brush, also tends to concentrate the shrinkage on the open surface of the restoration. A possible explanation is that the polymer-monomer-rich mixture may fasten on to the rough surface of the cavity. The monomer with some polymer in solution runs into all the minute undercuts of the cavity surface and on polymerization anchors the resin to the floor and walls of the cavity. When the resin is thus anchored, the shrinkage is forced to occur on the unanchored surface—in this case, the outside surface of the restoration.

Thus, the adherence of the resin to the surface of the cavity is an extremely important factor in determining the direction of the polymerization shrinkage. Roughness of the surface is important since the adherence appears to be largely mechanical; the adherence can be demonstrated by cementing together polished glass plates and slightly etched plates. The etched plates cannot be separated easily whereas the polished plates fall apart after being soaked in water. To obtain this result, it is necessary that the cavity surface be wetted with the resin. It would, therefore, seem to be the best practice when the pressure technic is used to introduce the monomer-polymer mixture into the cavity in a wet or slushy consistency and by no means in the heavy dough state. A matrix strip made of material to which the resin does not adhere also is essential. When the nonpressure technic is used, an excess of monomer is needed to wet the surface of the cavity thoroughly.

DIMENSIONAL CHANGES CAUSED BY ENVIRONMENT IN THE MOUTH

Water Sorption • Methyl methacrylate resin expands as it sorbs water. In time this expansion reduces or destroys the initial adhesion of the direct filling resins to hard tooth tissues. There is a high degree of correlation between the amount of water sorbed and the expansion which occurs.[12] The amount of linear contraction of the indirect filling resins[13] during drying is approximately the same as the linear expansion of the direct filling resins[8] when they are immersed in water; 0.3 to 0.5 per cent linear change or approximately 0.9 to 1.5 per cent by volume occurs. In the case of the direct resins it can be assumed that all or most of this expansion by water sorption takes place as the direct resins are polymerized in a dry tooth cavity and subsequently are exposed to saliva. In the case of the indirect resins, which are polymerized in gypsum molds and nearly saturated with water during polymerization, little or no further change occurs when the resins are soaked in water after polymerization.[13]

Just as the polymerization shrinkage does not occur uniformly throughout the restoration, the expansion caused by water sorption likewise does not occur uniformly. In addition to the reasons previously cited, the size and shape of the

12. Sweeney, W. T. Denture base material: acrylic resins. J.A.D.A. 26:1863 Nov. 1939.

13. Peyton, F. A., and Mann, W. R. Acrylic and acrylic-styrene resins: their properties in relation to their use as restorative materials. J.A.D.A. 29:1852 Oct. 1942.

cavity guarantee nonuniformity in both types of resins, since the resin is restricted more in some directions than in others.

Most direct filling resins reach an equilibrium with water and, therefore, are dimensionally stable; however, some are not. After reaching a maximum expansion, two of the commercial resins tested shrank slowly and uniformly approximately 0.007 per cent linearly per day. If the shrinkage continued at a uniform rate, as it did for 18 days, the resin would be at its original dimension in approximately two months. The cause of this type of shrinkage is not known.[3]

Warpage Due to the Release of Strain • Whenever methyl methacrylate resin is polymerized, strains are set up. The degree of strain depends on a number of factors, among which are the bulk of the resin, the restrictions of the mold, the presence or absence of water during polymerization, and the heating and cooling sequence. In both the indirect[14] and direct resins[3] it has been shown that this internal strain is at least partially released as the resin sorbs water and that the evidence of release is the shrinkage. In thin disks the linear shrinkage amounted, in some instances, to 0.3 to 0.4 per cent. If the disks were annealed prior to soaking in water, they did not exhibit the shrinkage apparently caused by the release of internal strain.

Coefficient of Thermal Expansion • Souder and Peters[15] were the first to measure and recognize the importance of thermal expansion of the teeth and the different restorative materials. Amalgam inserts, which had been placed in the mouth with fine wire embedded thermocouples in the inserts, cooled down to 5°C. (41°F.) when cracked ice was eaten and warmed up to 50 to 60°C. (122 to 140°F.) when very hot liquids were drunk. Measurements on direct filling resins[6] gave a range of 9°C. (48.2°F.) to 52°C. (125.6°F.). The thermal conduction along the thermocouple was disregarded in both instances. This factor should make little difference in the amalgam, which is a good conductor, but may decrease the temperature range of the direct filling resins. In any event, it is of importance to know that the tooth will expand or contract across the crown approximately 11 ppm per degree centigrade and methyl methacrylate polymer about 81 ppm per degree centigrade. The expansion should be greater for the direct filling resins because of the comparatively high content of residual monomer. The difference in expansion between tooth structure and the direct filling resins, amounting to at least 0.7 micron per centimeter per degree centigrade, is of some practical consequence, as the expansion allows the seepage of fluid between the surface of the cavity and the resin restoration. Such seepage has been observed in the mouth and apparently explains some of the discoloration that appears along the margin of the resin and other restorations.[6]

The effect of this difference in thermal expansion could be minimized by making the resins so adherent that the strain exerted by the temperature change would not break the adhesion between the resin and the tooth. Fillers with the proper index of refraction, so that the translucency of the resin would be satisfactory, and with a low thermal expansion would also be of help. The patient should always be instructed to avoid, insofar as possible, allowing extremely cold or hot food to contact resin restorations.

Thus, it can be seen that the dimensional changes that occur in these resins during polymerization, during sorption of water and during temperature fluctuations in the mouth probably constitute

14. Dahl, G. E. Dimensional stability of small cylinders of acrylic resins. Master's thesis, Northwestern University, 1946.

15. Souder, Wilmer H., and Peters, Chauncey G. An investigation of the physical properties of dental materials. D. Cosmos 62:305 March 1920.

their most serious faults. The development of the use of fillers to reduce thermal expansion and also the development of adhesion in the resin would minimize greatly the hazards of dimensional changes.

ESTHETIC PROPERTIES

Opacity and Color • Both the direct and the indirect filling resins may be pigmented and opacified so that they have a natural appearance far superior to that of any other dental filling material.

The opacity of these resins should simulate that of dentin and enamel combined, the opacities of which are approximately 70 and 40 per cent, respectively.[16] Actual tests show the opacity of direct filling resins to be from 30 to 40 per cent, that is, at the lower end of the permissible limits of the A.D.A. Specification No. 9 for Silicate Cement (35 to 55 per cent opacity).[17] The opacity and color of the direct or indirect resins may easily be varied over a wide range by adding different proportions of zinc oxide or titanium oxide for the opacifying and vermilion, yellow ochre, brown ochre, "Royal Blue" pigment and cadmium red for coloring.[18, 19] In fact, the color possibilities are almost unlimited.

Color Stability • Polymeric methyl methacrylate has a satisfactory color fastness in sunlight. There are available reasonably satisfactory color-fast pigments and opacifiers such as are used in ceramics. The indirect filling resins should not discolor when exposed to artificial sunlight and should comply with the color stability test of the A.D.A. Specification No. 12 for Denture Base Resin.[20] This statement does not necessarily apply to the direct filling resins which, in addition to the constituents present in the indirect type, have a promoter which activates the catalyst. The promoter, also called activator or accelerator, is usually a tertiary amine. The amine most commonly employed and the one believed to cause the least discoloration is dimethyl p-toluidine.[2] When the amine comes in contact with the catalyst—benzoyl peroxide is usually used—dark-colored products are formed. This shift toward the yellow occurs even in the absence of light. All the current direct filling resins that were tested, in which an amine activator appears to have been employed, discolored in the absence of light[21] from 1 to 3 NBS units. When subjected to the color stability tests for denture base resin,[20] they discolored still more, on an average, 5 NBS units. All but two of the resins continued to discolor after further storage in the dark.[21]

In an extensive monograph on the self-curing resins,[22] von Kreudenstein demonstrated that crown forms themselves may darken when exposed to ultraviolet radiation, also that touching a spot on resin specimens with chloroform or with cavity varnish causes a local discoloration far in excess of that in other portions of the specimens where the chloroform or cavity varnish has not been placed.

In 1948[23] the use of toluenesulfinic acid to promote the rapid polymerization of methyl methacrylate was advocated for a number of reasons, one of which was to

16. Paffenbarger, George C.; Schoonover, Irl C., and Sauder, Wilmer. Dental silicate cements: physical and chemical properties and a specification. J.A.D.A. & D. Cosmos 25:22 Jan. 1938.

17. Paffenbarger, G. C., and others. American Dental Association specification no. 9 for dental silicate cement; first revision, effective July 1, 1950. J.A.D.A. 40:186 Feb. 1950.

18. Grunewald, A. H. Prosthetic dentistry in the United States Navy. J.A.D.A. 28:606 April 1941.

19. Tuckfield, W. J., and Worner, H. K. Acrylic resins in dentistry. Obturators, flexible or rigid facial restorations, splints and artificial teeth. Austral. J. Den. 49:10 March 1945.

20. Swaney, Aubrey C., and others. American Dental Association specification no. 12 for denture base resin: second revision. J.A.D.A. 46:54 Jan. 1953.

21. Caul, Harold J., and Schoonover, I. C. The color stability of direct filling resins. J.A.D.A. 47:448 Oct. 1953.

22. Kreudenstein, T. S. V. Kariestherapie mit schnellhartendem Kunststoffe. Folge IV, Zahnheilkunde in Einzeldarstellungen, H. H. Rebel and P. Jaeger. München, Carl Hanser, 1952.

23. Hagger, O. Nine catalysts of ethylene at room temperature. Helvet. chem. acta. 31:1624, 1948.

decrease discoloration. Several investigators[5, 22, 24] report excellent color stability for the self-curing resins containing a sulfinic acid as the catalyst. When one such commercial product was subjected to the color stability test employed for denture base materials,[20] a slight discoloration occurred.[21] The change in color amounted to 4 NBS units, whereas the average of the amine-promoted resins was 5 NBS units. All specimens became more yellow.

There are other types of discoloration caused by unclean instruments,[22] by the decomposition of products that seep between the restoration and the cavity surfaces,[6] by external roughness or porosity of the restoration, which allow debris to collect on the surface and to infiltrate,[22] and by contamination with eugenol, phenol or related compounds.[24]

CHEMICAL EFFECTS IN THE MOUTH

Allergy and Effect on the Pulp • Polymethyl methacrylate is comparatively well tolerated by the tissues. The number of proved cases of reported allergy to the acrylic resins used in dentistry is small in view of their widespread employment in contact with human tissue. A comprehensive review of the world's literature shows a low sensitiveness of the oral mucosa to acrylic dentures.[25] Although the resins used indirectly and polymerized in plaster of Paris molds have little irritating effect, the polymerization of methyl methacrylate in contact with soft tissue causes an intense irritation and in contact with hard tooth tissues often results in inflammatory changes of varying degree in the pulp. These disturbances usually subside, and the pulp survives.

Staining and Fouling • The Kraus brothers reported[26] that in more than 500 clinical cases they found as a rule that the direct resin fillings leaked and on removal had a foul odor and that the enamel margins were often damaged. Therefore, they felt that the direct filling resins had no place in operative dentistry. Rosen[27] was of a similar opinion. Nealon and Seelig, however, reported favorable observations.[9, 28] Coy, Bear and Kreshover and Lucas did not take extreme positions.[29, 30] Many other investigators regard the resins as experimental materials because of staining, fouling, recurrent decay and pulp irritation.[31-33] In one instance[6] a jacket crown prepared from direct filling resin discolored. When the crown was sectioned to remove it, the discoloration was found to have penetrated the resin from ½ to 1 mm.

Solubility • There is a difference in the amount of water-soluble matter present in the self-curing and heat-curing types of denture base resin. The average values obtained for solubility were 0.06 and 0.02 mg. per square centimeter respectively for self-curing and heat-curing resins.[34] Slightly lower values were reported when a revised method of testing was used.[20] Apparently no one has demonstrated that these differences are significant in use.

24. Kramer, I. R. H., and McLean, J. W. A clinical and pathological evaluation of a sulphinic acid activated resin for use in restorative dentistry. Brit. D. J. 93:255 Nov. 18, 1952.

25. Nyquist, Göte. A study of denture sore mouth. An investigation of traumatic, allergic and toxic lesions of the oral mucosa arising from the use of full dentures. Acta Odont. Scandinavica 10: Suppl. 9, 1952.

26. Kraus, E. E., and Kraus, Leland L. Evaluation of the auto-polymer direct plastic filling materials. (Abst.) J. D. Res. 30:498 Aug. 1951.

27. Rosen, Ralph. Plastics—today's $64 question. J. Missouri D. A. 32:229 July 1952.

28. Seelig, Alexander. The effect of direct filling resins on the tooth pulp. J.A.D.A. 44:261 March 1952.

29. Coy, H. D.; Bear, D. M., and Kreshover, S. J. Autopolymerizing resin fillings. J.A.D.A. 44:251 March 1952.

30. Lucas, L. M. A critical appraisal of quick curing resins. D. Survey 28:940 July 1952.

31. Sherman, Harold; Fiasconaro, Joseph, and Cain, E. A., Jr. Clinical evaluation of a self-curing resin. (Abst.) J. D. Res. 31:515 Aug. 1952.

32. Fischer, C.H. Die Kunststoffefüllung aus schnellhartenden Polymerization. Zahnärztliche Fortbildung, heft 9, E. Reichenbach, Leipzig, Johann Ambrosius Barth, 1952.

33. Les resines autopolymerisantes. Communications by A. J. Held, M. Stocklin, L. Castagnola, B. Maeglin, W. Hess, P. Schmuziger, V. Brunner, C.H. Fischer and E. Dolder. Monatschr. f. Zahnheilk. 63:103 Feb. 1953.

34. Caul, Harold J.; Stanford, John W., and Serio, Andrew F. Properties of self-curing denture base resins. J.A.D.A. 44:295 March 1952.

No solubility data obtained by tests used for indirect filling resins seem to be available for the direct filling resins; however, because of the great similarity of the direct filling resins and the self-curing resins used in dental prosthesis, the values for the latter can be considered as generally applying to the direct filling resins. Solubility in the mouth has not been a problem generally, although instances have been observed by Dolder[33] of the disintegration of some restorations. The resin restorations should be comparatively insoluble.

Recurrent Caries • There is apparently no data showing the percentage of recurrent caries around direct resin fillings as compared with that recurring about silicate cement restorations although it is known that in the latter it is relatively small[35] perhaps on account of the fluorides[16] in the silicate cements.[35] It is possible that in the future some agent may be incorporated into the direct filling resins that will impart bacteriostatic properties to the resin and yet will not be unduly irritating to the pulp or other soft tissues. The evaluation of any filling material should include its efficacy in the prevention of recurrent caries and possibly in the stimulation of the production of secondary dentin. It is possible that a filling material can be too inert to have such properties. The comparative insolubility of the resins, therefore, can be considered to have both its advantages and its disadvantages.

MECHANICAL PROPERTIES

The mechanical properties of the resins of the heat-curing type are below those of metals and alloys used in dentistry,[36] especially in regard to strength, elastic limit, modulus of elasticity and hardness. In the past, clinical experience demonstrated that restorations of methyl methacrylate resin molded outside of the mouth and cemented in place did not, in general, withstand masticatory stress; for the most part, therefore, they have been abandoned.[37] The direct filling resins have even lower mechanical properties than do similar resins used indirectly;[1] that is, the self-curing acrylic resins—whether used as denture bases, repair or relining materials or as direct filling resins—are softer, weaker and less stiff and have a much higher flow than do similar resins polymerized by heating.[1, 8, 20, 32, 34] This difference in properties is the result of the relative completeness of the polymerization. Resins of the direct type may have up to 10 per cent by weight of residual monomer and those of the indirect type only 0.5 per cent. Thus, the self-curing resins contain greater amounts of unpolymerized monomer than do the heat-cured resins; the greater the residual monomer content, the poorer the mechanical properties.[8] If the self-curing resins are subsequently heated, they have properties equal to the heat-cured resins.[34] The direct filling resins, therefore, especially in their present state of development, are not indicated for restorations subject to masticatory stress. If used, the direct filling resins should usually be limited to Class III and Class V cavities. There appears to be little or no evidence that would lead to a contrary conclusion.

SUMMARY

A review of the many published reports on the physical and chemical properties of the direct and the indirect filling resins leads to the following conclusions:

1. The unrestricted volumetric shrinkage of the direct or the indirect filling

35. Volker, J. F.; Belkakia, E., and Mellilo, S. Some observations on the relationship between plastic filling materials and dental caries. Tufts D. Outlook 18:4 May 1944.

36. Souder, Wilmer, and Paffenbarger, G. C. Physical properties of dental materials. Washington, D. C., Government Printing Office, 1942.

37. Coleman, G. A. Present status of acrylics for operative application. Pennsylvania D. J. 16:269 Oct. 1949.

resins amounts to approximately 7 per cent. This shrinkage cannot be suppressed; but in the case of the direct filling resins, it can be made to take the direction least detrimental to the restoration. With the proper matrix technic, much of the shrinkage can be made to concentrate near the floor of the cavity and with the nonpressure or painting-in technic, on the open face of the restoration.

2. Direct and indirect filling resins expand from 0.9 to 1.5 per cent by volume when immersed in water. Some of the direct resins are exceptions in that they shrink after an initial expansion.

3. Warpage of the resin specimen occurs on sorption of water. The warpage is apparently caused by the release of strain, as annealed specimens do not warp after immersion in water.

4. The great difference between the resins and the hard tooth tissues in the coefficient of thermal expansion causes a space to open up and then to close between the tooth and the filling at temperature ranges encountered in the mouth. This temporary space frequently allows a fluid exchange at the margins of a restoration.

5. The resins are probably the most life-like in appearance of all dental materials.

6. The indirect filling resins are color stable, but unfortunately none of the current (March 1953) direct filling resins are stable when subjected to the test for color stability in the current American Dental Association specification for denture base resins.

7. Comparatively few cases of allergic reaction to polymethyl methacrylate have been reported in the literature.

8. When polymerization takes place in the cavity of a tooth, inflammatory changes of varying degrees may occur in the pulp.

9. The staining and fouling of the direct resin fillings have been reported by some dentists as being sufficiently severe to preclude the use of the resins. Other dentists do not take such an extreme position.

10. The amount of water-soluble matter in the direct filling resins is about three times that of the indirect filling resins, but for both types the amounts are so small that they seem to be of little consequence clinically.

11. The comparative insolubility of the resins has its advantages and its disadvantages. One of the advantages is that the resins do not waste away in the mouth as do the silicate cements. On the other hand, their extremely low solubility prevents the protecting action against recurrent caries that the silicate cements appear to have. Possibly a suitable soluble antibiotic or antiseptic could be added to the resin to impart an anticariogenic effect.

12. The low values of the resins in hardness, strength and stiffness as compared to those of metals and alloys generally preclude their use in any restorations which will be subjected to severe masticatory stress. Consequently, indirect filling resins now are scarcely used in restorative dentistry. The direct filling resins have even lower mechanical properties than the indirect because of the greater residual monomer content of the direct resins. The direct filling resins are, therefore, even more unsuitable for restorations subject to stress than are the indirect filling resins. There appears to be no evidence available that any of the current direct filling resins can serve as replacements for metals and alloys in operative dentistry. The resins do have a field of usefulness in Class III and Class V cavities and in some Class IV cavities.

13. It is suggested that in the evaluation of any filling material the following criteria be added to the customary ones:

the ability of the filling material to stimulate the production of secondary dentin and the ability of the filling material to prevent recurrent decay.

CONCLUSIONS

It is believed that the direct filling resins will become an important material in operative dentistry. If the adhesion to hard tooth tissues under natural conditions and if the color stability of the direct filling resins can be improved, it is predicted that these resins will replace silicate cements in operative dentistry, just as polymethyl methacrylate has replaced hard rubber as a denture material in prosthetic dentistry.

Bactericidal effect obtained by addition of antibiotics to dental cements and direct filling resins

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The purpose of this investigation was twofold: (1) to evaluate various dental filling materials as to their bactericidal effect and (2) to indicate a possible means of increasing such action.

It is generally agreed that bacteria invade the dentin beyond the region of decay. Seltzer in a study of cavities[1-3] found bacteria below the floor of the cavity in 85 per cent of medium-sized preparations and in 93 per cent of deep cavities.

A study of the literature indicates that it is not possible to sterilize the invaded dentin prior to inserting restorations. The common practice of swabbing the cavity with phenol and alcohol is certainly questionable and one of the least effective methods of sterilization. Miller[4] found that phenol requires 45 minutes to penetrate 1 mm. of dentin. Hardwick,[5] in a study of 30 sterilizing agents, placed phenol twenty-ninth on his list. Seltzer,[1-3] in testing various sterilizing agents, concluded that Morson's Kreosote is 85 per cent effective; silver nitrate proved only 28 per cent effective.

Stephan, Dorfman and Muntz,[6] reporting on the penetrability and steriliz-

1. Seltzer, Samuel. Effective duration of some agents used for dentin sterilization. J. D. Res. 21:115 April 1942.

2. Seltzer, Samuel. The bacteriologic status of the dentin after cavity preparation. J.A.D.A. 27:1799 Nov. 1940.

3. Seltzer, Samuel. The comparative value of various medicaments in cavity sterilization. J.A.D.A. 28:1844 Nov. 1941.

4. Miller, W. D. On the comparative rapidity with which different antiseptics penetrate decalcified dentin. D. Cosmos 33:337, 1891.

5. Hardwick, J. L. The sterilization of carious dentin. Proc. Roy. Soc. Med., Sec. Odont. 42:815 Oct. 1949.

6. Stephan, R. M.; Dorfman, Albert, and Muntz, J. A. In vitro studies on sterilization of carious dentin. II. Extent of infection in carious lesions. III. Effective penetration of germicides into carious lesions. J.A.D.A. 30:1901; 30:1905 Dec. 1943.

ing effect of silver nitrate, showed that a saturated aqueous solution sterilized dentin to a depth of 0.3 mm. in one minute, 0.7 mm. in three minutes and 1.3 mm. in ten minutes. Both Seltzer[1-3] and Besic[7] have demonstrated that live bacteria can be recovered from dentin even a year after being sealed in a restoration.

Since sterilization of dentin is thus shown to be problematical at best, the question arises as to why recurrent decay is not encountered more often. The consensus of opinion is that the sealing of the cavity causes a gradual abatement of the carious process. Consequently, the bacteria usually die or become dormant. This result may be due to the elimination of moisture necessary for the enzyme action of the bacteria. Seepage of saliva, therefore, may reactivate dormant organisms as well as reinoculate the dentin (Bartels,[8] Frisbie and Nuckolls,[9,10] and Besic[7]).

Seltzer[1-3] observed that pulpitis and death of the pulp may occur years after a tooth has been filled. Whether the cause is reactivation of dormant bacteria or the effect of their toxins is at present undetermined.

Besic[7] suggests:

> An effective sterilizing agent may be necessary in deep decayed lesions near the pulp, not to stop carious processes from progressing . . . but to eliminate possible surviving organisms and eradicate a possible focus of bacterial growth that may eventually injure the pulp or tissues elsewhere in the body through focal infection.

Although the role of the filling agent in deactivating bacteria has been recognized repeatedly, the importance of this effect has been underestimated. The following experiment was designed to determine the bactericidal effect of common filling materials and to establish the possibility of increasing such action by reinforcement with one or more antibiotics.

Pellets of equal diameter were made from standard zinc cements, silicate cements, direct filling resin, silver amalgam and standard zinc cement fortified with varying amounts of aureomycin, bacitracin, chloramphenicol and streptomycin (Table 1).

The pellets, after setting for a half-hour, were placed on dextrose agar plates carrying uniform mixed organisms commonly found in dental caries. "Dia-discs" of aureomycin, bacitracin, chloramphenicol and streptomycin were used as controls.

After incubation for 48 hours the following results were noted: For all materials except the direct filling resin, a zone of inhibition was obtained around the pellet. These zones varied in diameter from 0 mm. for the resin to 35 plus mm. for zinc cement reinforced with antibiotics (40 mg. to 5 Gm.).

Smears were taken from the zones of inhibition and cultured for 48 hours (Fig. 1 and Table 1). Growths were obtained in Specimens 1 through 20; therefore, in these specimens a partial bactericidal effect was indicated. No growths were obtained in Specimens 21 through 28; therefore, complete bactericidal action was indicated. The exception again was Specimen 11, the direct filling resin, which showed no zone of inhibition.

Hobby and others[11] have demonstrated that each antibiotic is specific as regards the group of organisms against which it is effective. Some have proved more effective against gram-positive bacteria, some against gram-negative microorganisms, others against the acid-fast bacilli and still others against the pathogenic fungi or the rickettsial group of organisms.

7. Besic, F. C. The fate of bacteria sealed in dental cavities. J. D. Res. 22:349 Oct. 1943.

8. Bartels, H. A. Consultant symposium: our empiric cavity sterilization. New York D. J. 17:3 Jan. 1951.

9. Frisbie, H. E., and Nuckolls, James. Caries of the enamel. J. Am. Col. Den. 13:84 June 1946.

10. Frisbie, H. E., and Nuckolls, James. Histopathological study of caries of the human enamel operating beneath apparently sound and intact enamel surfaces. J. D. Res. 26:181 June 1947.

11. Hobby, G. L.; Lenert, T. F., and Dougherty, N. Newer antibiotics: factors influencing their antimicrobial activity. Ann. New York Acad. Sc. 53:27 Aug. 30, 1950.

Table 1 • Bactericidal effect of common filling materials and zinc cement reinforced with single antibiotics

Specimen	Material tested	Approximate diameter of zone of inhibition	Subculture after 48 hrs.
Filling material:			
1	Zinc cement—Fleck's	18 mm.	Gram-pos. Gram-neg.
2	Argenite—Fleck's	20 mm.	Gram-pos. Gram-neg.
3	Red copper—Fleck's	18 mm.	Gram-pos. Gram-neg.
4	Tenacin—Caulk	22 mm.	Gram-pos. Gram-neg.
5	Zinc cement—S. S. White	21 mm.	Gram-pos. Gram-neg.
6	Lithium cement—Schaefer	20 mm.	Gram-pos. Gram-neg.
7	Di-Cem—Caulk	18 mm.	Gram-pos. Gram-neg.
8	Zinc silicate—S. S. White	36 mm.	Gram-pos. Gram-neg.
9	Petralit—Premier	20 mm.	Gram-pos. Gram-neg.
10	Synthetic porcelain—De Trey's	16 mm.	Gram-pos. Gram-neg.
11	Kadon—Caulk	0	Gram-pos. Gram-neg.
12	Silver amalgam	14 mm.	Gram-pos. Gram-neg.
Zinc cement—S. S. White fortified with:			
13	Aureomycin 10 mg.:5 Gm.	25 mm.	Gram-pos.
14	Bacitracin 10 mg.:5 Gm.	27 mm.	Gram-pos.
15	Chloramphenicol 10 mg.:5 Gm.	28 mm.	Gram-pos.
16	Streptomycin 10 mg.:5 Gm.	32 mm.	Gram-pos.
17	Aureomycin 20 mg.:5 Gm.	32 mm.	Mold*
18	Bacitracin 20 mg.:5 Gm.	25 mm.	Gram-pos.
19	Chloramphenicol 20 mg.:5 Gm.	35 + mm.	Gram-pos.
20	Streptomycin 20 mg.:5 Gm.	35 + mm.	Gram-pos.
21	Aureomycin 40 mg.:5 Gm.	35 + mm.	No growth
22	Bacitracin 40 mg.:5 Gm.	35 + mm.	No growth
23	Chloramphenicol 40 mg.:5 Gm.	35 + mm.	No growth
24	Streptomycin 40 mg.:5 Gm.	35 + mm.	No growth
Controls: "Dia-discs" of:			
25	Aureomycin	28 mm.	No growth
26	Bacitracin	26 mm.	No growth
27	Chloramphenicol	24 mm.	No growth
28	Streptomycin	32 mm.	No growth

*Mold was probably due to contamination.

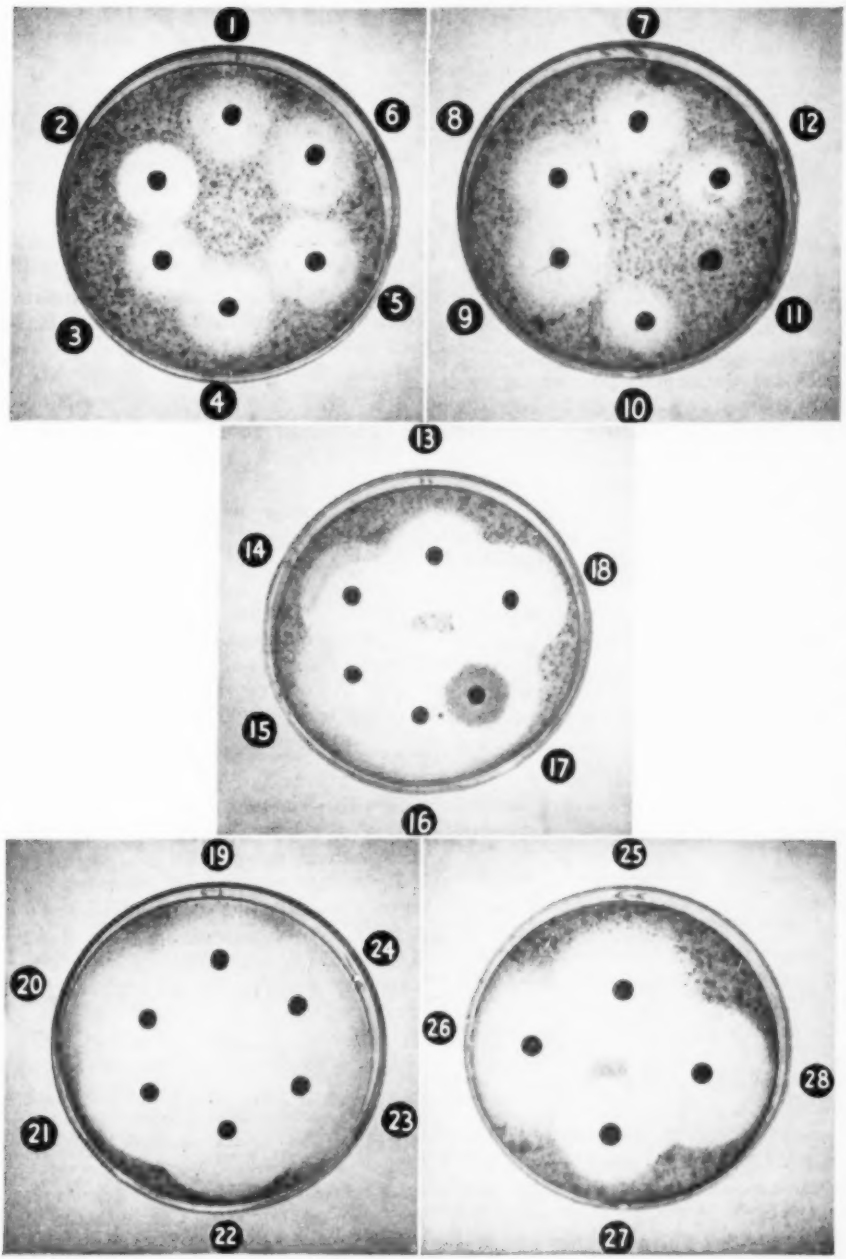

Fig. 1 • Zones of inhibition obtained on specimens listed in Table 1

There is no explanation at present, however, for the fact that the antimicrobial spectra of these various substances differ from each other.

Since the dental lesion is invaded by a variety of mixed microorganisms, it was decided to test the effectiveness of a mixture of several antibiotics as compared with a single antibiotic. The single antibiotic selected was penicillin. The mixture consisted of penicillin, bacitracin and streptomycin.

Penicillin was selected because it is slightly acid, effective against growing cells and against gram-positive organisms. Streptomycin was selected because it has an organic base and is effective against resting cells as well as against rapidly dividing cells and also against gram-negative organisms. Bacitracin was selected as representative of the group of antibiotics of bacterial origin as opposed to those derived from the fungi.

The experiment was set up as follows: Dextrose agar pour plates carrying uniform cultures of mixed organisms were prepared. Four commercial zinc cements (Fleck's, Schaefer, Caulk and S. S. White) and two commercial silicate cements (De Trey and S. S. White) were used as bases. On each pour plate were placed the following:

1. A pellet of standard cement which had set for half an hour.
2. A pellet of "wet" standard cement of inlay cementation consistency.
3. A pellet of standard cement fortified with penicillin, 20 mg. : 5 Gm. "wet."
4. A pellet of standard cement fortified with a mixture of penicillin, bacitracin and streptomycin, 20 mg. : 5 Gm. "wet."
5. "Dia-disc" of penicillin.

The results are summarized in Table 2; results shown in Figure 2 are typical of all results obtained.

In this experiment all cements in the "set" state showed no areas of inhibition. Definite zones of inhibition were observed around all "wet" specimens. Addition of antibiotics increased zones of inhibition considerably. Larger zones of inhibition were obtained in every instance with the polyantibiotic mixture as compared with the single antibiotic. Con-

Table 2 • Comparison of zinc cement reinforced with penicillin and with a mixture of antibiotics

	"Set"	"Wet"		Penicillin 20 mg.:5 Gm. "wet"		Penicillin, bacitracin, streptomycin 20 mg.:5 Gm. "wet"	
Material tested	Zone of inhibition	Zone of inhibition	Sub-culture	Zone of inhibition	Sub-culture	Zone of inhibition	Sub-culture
Zinc cement Fleck's	0	+	Gram-pos. Gram-neg.	+	No growth	+	No growth
Zinc cement Schaefer	0	+	Gram-pos. Gram-neg.	+	Gram-neg.	+	No growth
Zinc cement Caulk	0	+	Gram-pos. Gram-neg.	+	Gram-neg.	+	No growth
Zinc cement S. S. White	0	+	Gram-pos. Gram-neg.	+	Gram-neg.	+	Gram-positive
Silicate cement S. S. White	0	+	Gram-pos. Gram-neg.	+	No growth	+	No growth
Silicate cement De Trey	0	+	Gram-pos. Gram-neg.	+	Gram-neg.	+	Gram-positive

siderably larger zones were obtained with the cements plus the antibiotics, single or combined, as compared with the "Dia-disc" control of penicillin. Some factor in the cement, probably the acid, increased the effectiveness of the antibiotics.

To determine the effect of the addition of antibiotics to direct filling resin, aureomycin 40 mg. : 5 Gm. was added to Kadon. The results are summarized in Table 3 and shown in Figure 3.

It was decided to test next the comparative bactericidal effect of regular and fortified cements on carious lesions in recently extracted human teeth. The following experiment was set up: Twenty-eight freshly extracted teeth with cavities were selected. Cavities were prepared and cultures taken from the floor of each cavity. In most cases decay was only partly removed. Six teeth were filled with lithium cement (Schaefer); six teeth were filled with the same cement fortified with a mixture of aureomycin, bacitracin, chloramphenicol and streptomycin, 20 mg. : 5 Gm.; eight teeth were filled with Durodent Enamel (Schaefer) and an equal number with the same cement fortified with a mixture of aureomycin, bacitracin, chloramphenicol and streptomycin, 20 mg. : 5 Gm. The cleansing of the cavities consisted of wiping them with pledgets of cotton moistened in water and then drying them with a blast of warm air. After setting had taken place, each tooth was coated with paraffin. This was done to prevent seepage and contamination through the periapical foramen and to eliminate the possibility of leakage of the filling materials. The teeth were placed in tubes of tap water and incubated at body temperature (37° C.) for two weeks.

The paraffin was then removed, and the teeth were scrubbed with soap and water. All restorations were removed by means of slowly rotating burs, which were repeatedly sterilized in molten metal for 20 seconds and allowed to cool. Cultures were taken from the dentin below the floor of the cavities and incubated. The results appear in Table 4.

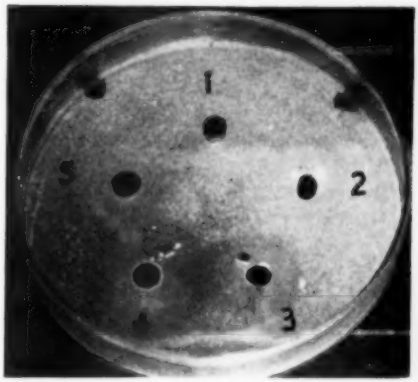

Fig. 2 • Zones of inhibition obtained on cement fortified with penicillin and with polyantibiotic mixture; 1, standard "set" cement (Fleck's); 2, standard "wet" cement; 3, standard "wet" cement fortified with penicillin, 20 mg. : 5 Gm.; 4, standard "wet" cement fortified with polyantibiotic mixture; 5, "Dia-disc" of penicillin

Growths were obtained from every cavity before it was filled. After removal of the fillings, growths were obtained in every instance where regular cements were used for filling. When fortified cements were used, no growths were obtained in 13 instances. A growth was present in only one culture.

Since all *in vitro* tests are valid only within the limitations of the experiment, it was necessary to determine the bactericidal effect of fortified cements in dental lesions *in vivo*.

Thirty patients were selected. For each patient two cavities were prepared. Cuttings taken from the floor of the cavity were placed in culture tubes and incubated. The cleansing of each cavity consisted of wiping it with cotton moistened with carbon tetrachloride and drying it with warm air. In each case, one cavity was filled with lithium cement (Schaefer), the other with the same cement fortified with a mixture of antibiotics (aureo-

Table 3 • Effect of addition of antibiotic to direct filling resin

Material tested	Subcultures after 48 hrs.
1. Kadon	
2. Kadon with aureomycin 40 mg.:5 Gm.	No growth
3. "Dia-disc" of aureomycin	Gram-positive growth

Fig. 3 • Effect of addition of antibiotic to direct filling resin; 1, direct filling resin; 2, direct filling resin fortified with aureomycin; 3, aureomycin

mycin, bacitracin, chloramphenicol and streptomycin) 20 mg. : 5 Gm. In every instance where one cavity was deeper or more extensive than the other, the antibiotic cement was used for it. Teeth were isolated with cotton rolls during the filling operation. The cultures in the tubes were incubated for 48 hours at 37° C. Fifty-five of the 60 cultures showed positive growth of organisms, five were negative. Of the five negative cultures, four were from teeth which had been filled with the standard cement and one from a tooth filled with the antibiotic cement. These five teeth were eliminated from the rest of the test.

In from three to five weeks all fillings were removed. In this part of the experiment, all teeth were isolated with a rubber dam. Slowly rotating burs, repeatedly sterilized in molten metal for 20 seconds, were used in the operation. Cuttings from the dentin under each filling were placed in culture tubes and incubated at 37° C. for 48 hours.

Of the 26 teeth showing positive growths before being filled with standard cement, 22 showed positive growths of organisms after removal of fillings and 4 showed no growth.

Of the 29 teeth showing positive growths before being filled with antibiotic cement, only 5 still showed positive growths and 24 showed no growth.

The number of cases is too small to

Table 4 • Comparative bactericidal effect of regular and fortified cement in human teeth

Material tested	Cultures before filling	Cultures two weeks after removal of fillings
Lithium cement (Schaefer) in 6 teeth	All positive	All positive
Lithium cement with mixture of antibiotics 20 mg.:5 Gm. in 6 teeth	All positive	All negative
Durodent Enamel (Schaefer) in 8 teeth	All positive	All positive
Durodent Enamel with mixture of antibiotics 20 mg.:5 Gm. in 8 teeth	All positive	One positive Seven negative

draw a positive conclusion; however, it appears highly probable that a greater degree of protection than is now possible can be obtained by the incorporation of a polyantibiotic mixture into dental cements and direct filling resins.

SUMMARY

1. It is doubtful that sterilization of the cavity prior to restoration can be achieved.

2. Zinc cements, silicate cements and silver amalgam have some bactericidal effect and therefore undoubtedly play a role in the prevention of recurrent decay.

3. Direct filling resins have no bactericidal effect.

4. Bactericidal effect of zinc and silicate cements can be increased by the addition of antibiotics.

5. Addition of antibiotics to direct filling resin imparts bactericidal effect to this material.

6. Some factor in the cement, probably its acid content, increases the bactericidal action of antibiotic agents.

45 West Eighty-first Street

Controls in Research • It would seem obvious that in order to decide whether a particular drug is effective in preventing or curing a given disease, one should not only know what happens to persons receiving the drug, but also have some indication of what would have happened if they had not received the drug. Only if the drug favorably alters the natural history of a disease should it be considered to have a beneficial effect. This obvious fact, however, is frequently overlooked.

A recent article concluded, for example, that irradiation of the pituitary gland was of benefit to certain cases of arterial hypertension, because 62 per cent of patients so irradiated showed clinical improvement. Other authors, however, demonstrated that while 68 per cent of patients showed clinical improvement following irradiation of the pituitary gland, 78 per cent of patients not receiving the treatment showed clinical improvement. The latter authors recognized that in order to interpret results of irradiation as beneficial, they must show not only clinical improvement in *some* patients, but clinical improvement on a greater scale than if no irradiation were given. *G. F. Badger, "Biostatics." In Textbook of Preventive Medicine, H. R. Leavell and E. G. Clark, editors, p. 588.*

Direct resin fillings

Herbert D. Coy, D.D.S., Richmond, Va.

Self-curing resins were introduced to the American dental profession approximately two years after the publication of the Blumenthal report in 1947.[1] This report was part of a study of German scientific developments by a commission operating under the direction of the U. S. Military Government of Germany after World War II. The commission reported the scientific secret of German research workers, the discovery of a method for hardening acrylic resins at room temperature.

To a large extent, the studies to determine the physical properties of direct filling resins have been carried on through the cooperative research of the American Dental Association and the National Bureau of Standards.[2-6] In addition several clinical reports have been made on interesting phases of the subject.[7-10]

The report made by the author at the annual session of the American Dental Association in October 1951[11] was based on only 16 months of observation. This is too short a period to form any conclusions relative to the suitability of the resins for use as permanent restorations. The present report, therefore, covers additional experience in the clinical behavior of these fillings.

Since the final appraisal of any filling material must be established by clinical experience, the time is still too short. Too little has been written about this important phase of the research, and the reports of different authors are at wide variance. They appear to be based in part on opinions rather than on factual data.

PRIMARY QUALITIES OF DIRECT FILLING RESINS

The physical properties of the direct filling resins have been established by the research associates at the National Bureau of Standards as follows:

1. Volume shrinkage during curing 5.5 per cent to 8 per cent.

Presented at the Midwinter Meeting of the Chicago Dental Society, February 9, 1953.

Director, dental clinic, School of Dentistry, Medical College of Virginia.

1. Blumenthal, L. M. Recent German developments in the field of dental resins. Office of Military Government for Germany (U.S.) Fiat Report No. 1185, May 1947.

2. Wolcott, Robert B.; Paffenbarger, George C., and Schoonover, Irl. C. Direct resinous filling materials: temperature rise during polymerization. J.A.D.A. 42:253 March 1951.

3. Paffenbarger, George C.; Wolcott, Robert B., and Smith, Denton L. Direct resinous filling materials: an investigation of Vita-filling. J.A.D.A. 42:558 May 1951.

4. Nelsen, R. J.; Wolcott, R. B., and Paffenbarger, G. C. Fluid exchange at the margins of dental restorations. J.A.D.A. 44:288 March 1952.

5. Smith, Denton L., and Schoonover, I. C. Direct filling resins: dimensional changes resulting from polymerization shrinkage and water sorption. J.A.D.A. 46:540 May 1953.

6. Caul, Harold J., and Schoonover, I. C. Color stability of direct filling resins. J.A.D.A. 47:448 Oct. 1953.

7. Lefkowitz, William; Seelig, A., and Zachinsky, Leo. Pulp response to a self-curing filling material. New York D. J. 15:376 Aug.-Sept. 1949.

8. Nironen, P. Some possible uses for acrylic resins in dentistry. Odont. tskr. 58:118, 1950.

9. Boyd, Drexell A. Personal communication, Dec. 1952.

10. Rosen, Ralph. Plastics—today's $64 question. J. Missouri D. A. 32:229 July 1952.

11. Coy, H. D.; Bear, D. M., and Kreshover, S. J. Auto-polymerizing resin fillings. J.A.D.A. 44:251 March 1952.

2. Volume expansion during water absorption from 1 per cent to 1.5 per cent.

3. Thermal dimensional change about eight times that of tooth structure.

4. Nonadhesion to tooth structure.

5. Insolubility in fluids of the mouth.

6. Color instability.

In stating the primary qualities most desired in a filling material for permanent restorations, G. V. Black[12] listed them in order of their importance as follows:

1. Indestructibility in the fluids of the mouth.

2. Adaptability to the walls of the cavity.

3. Freedom from shrinkage or expansion after having been made into fillings.

4. Resistance to attrition and sustaining power against the force of mastication.

Since Black's standards have been almost universally accepted, they provide a basis for evaluating the direct filling resins.

Indestructibility in the Fluids of the Mouth • The direct filling resins are believed to be completely insoluble in the fluids of the mouth. In this respect they compare favorably with amalgam and gold foil and are superior to the silicate cements and to gold inlays. They are superior to gold inlays because the latter are secured to the cavity walls by zinc phosphate cement, which is highly soluble.

Adaptability to the Walls of the Cavity • The direct filling resins are readily adapted to the cavity walls, especially when the compensating or brush technic is used.[13] The National Bureau of Standards and the American Dental Association reported an average curing shrinkage of 7 per cent by volume when direct resin fillings were placed by the pressure technic. It is thought that by using the technic of applying repeated additions of resin, some of this shrinkage is neutralized and that the shrinkage may not represent as great a hazard as seemed probable at first. Clinical evidence supports this assumption.

Freedom from Shrinkage or Expansion After Having Been Made into Fillings • While usually most of the curing shrinkage of the direct filling resins takes place in a few minutes and little occurs after 8 to 20 minutes, the shrinkage and expansion which occur in the resin as its temperature is changed because of the intake of cold and hot foods are thought to be even more detrimental to the filling than the setting contraction. Nelsen[4] has shown that this reaction causes an exchange of fluids between the restoration and the tooth structure in most of the filling materials. The approximate coefficient of thermal expansion of the various filling materials and the teeth is as follows:

Parts per million per degree C.	
Acrylic resin	80
Amalgam	24
Gold foil	14
Tooth structure	10
Silicate	7

Experience based on many years of use has shown that in the case of gold foil and amalgam the so-called percolation caused by dissimilar expansion due to temperature changes has not interfered with the value of either as a permanent filling material.

It would seem that a material with a coefficient of thermal expansion almost eight times greater than that of tooth structure should be condemned as to its usefulness without further consideration, for the temperature of foods taken into the human mouth may easily cause the resin restoration to pass through a

12. Black, G. V. Work on operative dentistry, vol. 4. Chicago, Medico-Dental Publishing Co., 1908.

13. Nealon, F. H. Acrylic restorations: operative non-pressure procedure. New York J. Den. 22:201 May 1952.

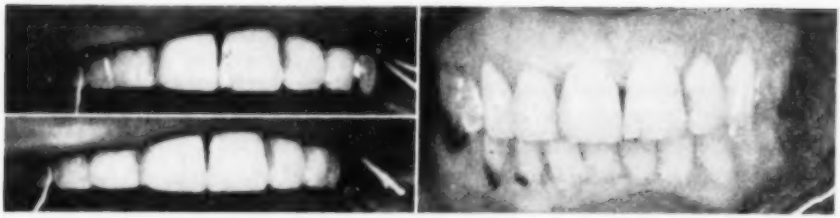

Fig. 1 • Left above: Mesioincisal cast gold inlay cemented to place with box cut for reception of direct resin filling. Left below: Resin facing in place but not yet finished. Right: Completed restoration

thermal change of 80° F. or a range from 40° F. to 120° F., as has been demonstrated.[4]

A study by Fiasconaro and Sherman[14] states that air forced under fillings made of gold foil, cement and Kryptex required a pressure of 50 pounds per square inch to break the cavity seal, compared with 5.7 to 8.2 pounds per square inch for direct filling resins. It must be pointed out, however, that when the air pressure was applied during a temperature change the marginal resistance was greatly reduced. Also, it has not been determined that this variation in resistance to air pressure between the resins and the other materials is a major factor in determining its suitability as a filling material.

Resistance to Attrition and Sustaining Power Against the Force of Mastication • The acrylic filling resins are soft when compared with any metallic filling material. They have a Knoop hardness of 16 compared to 32 for pure gold.[15] It is evident, therefore, that they have little resistance to the force of mastication and should be placed only in regions free from stress. Their use thus would be limited to Class III and Class V cavities.

Although in the dental clinic at the Medical College of Virginia, occasionally a direct resin filling has been placed in a Class IV cavity, better results have been attained by placing gold inlays in this type of cavity, cutting a labial box in the gold, then masking the metal with an opaque material and finally facing it with resin.

Figure 1 shows three views of a mesioincisal gold inlay made as just described. Figure 1, left above, shows the inlay in place. Figure 1, left below, shows the resin facing in place but not polished. Before the resin was inserted, an opaque masking material was painted on the gold so that the yellow color of the gold would not change the color of the resin. In the completed restoration (Fig. 1, right), it can be seen how well the color of the background has been masked.

The tendency of resins to flow under stress precludes their use in stress-bearing areas. This restriction applies to full jacket crowns as well as to fillings.

Figure 2 shows a typical failure in resin jacket crowns. Harris[16] and others advocate the use of direct resins for jacket crowns; however, the research associates at the National Bureau of Standards have published data and illustrations showing that the resins are not suitable for jacket crowns.[4]

Figure 3, left, shows a cervical restoration in a mandibular left cuspid. This direct resin filling is 24 months old.

14. Fiasconaro, J. E., and Sherman, Harold: Sealing properties of acrylics. New York D. J. 18:189 May 1952.
15. Skinner, E. W. Dental materials. J. Tennessee D. A. 32:415 Oct. 1952.
16. Harris, LaMar W. Application of acrylics to operative dentistry. J.A.D.A. 30:553 April 1, 1943.

It was placed by the pressure method. The margin is stained. It may be that this staining is the result of the difference in expansion between the tooth and the resin, but this assumption has not yet been established as a fact. The filling was removed, and the stain was found to be about 2 mm. deep. There was no foul odor about the filling, nor was there any gross evidence that any decay or decalcification was present. This performance compares favorably with the performance of silicate cement.

This restoration was replaced by another direct resin filling placed by the Nealon technic[13] (Fig. 3, right). After ten months this restoration does not show the brown line of discoloration, but as yet the time is too short to draw any permanent conclusion. Similar results, observed when a number of pressure restorations were replaced by the Nealon technic, indicate that the paint-in technic may be more effective in preventing marginal discoloration than the pressure technic. Similar results have not always been attained, however, for some painted-in restorations also show discoloration. Of course, most silicate cement restorations show discoloration, too; but silicate cement has an anticariogenic action whereas this characteristic has not yet been demonstrated in the filling resins.

It will be noted that the direct filling resins meet the first two of Black's primary requirements and that the fourth primary requirement limits their use to nonstress-bearing areas. The third primary requirement concerns the shrinkage and expansion due to thermal changes

Fig. 2 • Typical failure of two resin jacket crowns

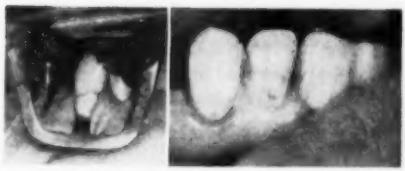

Fig. 3 • Left: Cervical restoration, 24 months old, in mandibular left cuspid. Right: Same tooth with restoration replaced by another direct resin filling placed by the Nealon technic

and the effect of the high thermal expansion of the material on fillings in the mouth.

When the direct filling resins were first introduced into the dental clinic of the Medical College of Virginia, School of Dentistry, in September 1949, the technic was impeded by a limited knowledge of the physical properties of the resins and by faulty instructions from the manufacturers.

Because of lack of understanding, many of the first fillings that were placed became loose soon after insertion probably because of premature removal of the matrix, insufficient pressure during polymerization and finishing too soon after insertion.

There was also a great tendency for these early fillings to discolor at the margins. This discoloration was probably due to insufficient pressure during polymerization and to faulty mixing, which probably permitted incorporation of air into the mixture and thus caused the tendency to discoloration. Many of the fillings that showed brown margins were replaced. Such fillings were removed under a rubber dam; in no case had the stain penetrated far beyond the margin. There was no evidence that the cavity seal had been broken far beyond the margin nor that moisture or deterioration had extended along the cavity walls or deep into the cavity; there was no odor.

These observations indicate that the temperature change from hot and cold substances taken into the mouth, if it

reaches the filling at all, is reduced so that the over-all thermal change is not sufficient to break the cavity seal in the average anterior restoration. It would be well to state here that the size of the restoration greatly affects the size of the marginal opening, for, although the percentage of change remains constant, the larger the volume of material, the larger will be the volume change.

This clinical observation may appear striking in view of the fact that these restorations were always placed by students. Of course, when the filling had become loose, both foul odor and softened dentin were observed if the filling had been loose for some time. Actually there were very few such cases. These results are in direct disagreement with the statements of Rosen[10] and of Kraus and Kraus,[17] who assert that the direct resin fillings almost always have an odor and that there is a softening of the tooth structure adjacent to the filling. A possible explanation for the variance of Rosen's results from the experience of students in the dental clinic of the Medical College of Virginia is that his technic and procedure may be such as not to make the maximum use of the physical properties of the material.

It is not uncommon in the dental profession for failures to be attributed to the inadequacies of the materials used, when, in fact, failures result in far greater number from improper use of materials. This conclusion has been reached as the result of a great many clinical examinations and the observation and study of hundreds of full mouth roentgenograms. This statement applies as well to the use of amalgam and gold foil as to the use of resins and silicates.

In the clinic at the Medical College of Virginia the pressure technic has been replaced by the Nealon,[18] or compensating, technic; and much less tendency toward discoloration either at the margins or in the body of the filling has been observed. This result could be due in part to improvement in the material itself and to the superiority of the improved technic.

SECONDARY QUALITIES OF DIRECT FILLING RESINS

Black listed also a group of secondary qualities, on the basis of which he evaluated the usefulness of a material for restoring teeth. These in order of their importance as listed by him are:

1. Color or appearance.
2. Nonconductivity of thermal impression.
3. Convenience of manipulation.

Color or Appearance • The direct filling resins do not prove color-stable when tested in the laboratory or when used in the mouth. The color change may be caused by a discoloration product formed when the resin cures, or the exposure to light may cause the discoloration of the walls of the cavity and the cavity surface of the resin restoration. The discoloration would be aggravated by any seepage of food or saliva between the cavity wall and the resin filling.

Nonconductivity of Thermal Impression • The direct filling resins are entirely satisfactory as nonconductors of thermal change.

Convenience of Manipulation • In the pressure technic, the resins proved more difficult to use than any other plastics because of the difficulty of maintaining sufficient pressure over a comparatively long period of time. In the Nealon technic, however, the necessity of maintaining pressure during polymerization has been eliminated; and, therefore, their manipulation is not difficult.

17. Kraus, E. E., and Kraus, L. L. Evaluation of the auto-polymer direct plastic filling materials. (Abst.) J. D. Res. 30:498 Aug. 1951.

The Nealon or paint-in technic is a simple one. The correct shade of polymer is selected, and the polymer is placed in a clean, dry dappen dish. With a no. 000 sable hair brush, the cavity is wet with monomer. The brush is again wet with monomer, and a small bead of polymer is picked up and placed in the cavity. This procedure is repeated until the cavity is filled; short intervals are allowed between each application. It is important that enough monomer be used to saturate all the polymer. When the surface loses its sheen, it is too dry and needs additional monomer. Care is taken not to dip the brush into the monomer until it is wiped clean after each application, for if the polymer is allowed to contaminate the monomer, the chemical reaction will start too soon and prevent the proper curing of the material.

Whenever possible, all Class III cavities should be boxed in with a matrix to prevent overfilling. This procedure saves considerable time in the finishing operation and prevents the filling from becoming loose when the bulky excesses are removed. Separation should be obtained to insure proper tooth form and contact.

The finishing of direct resin fillings should be done at a subsequent sitting because the polymerization continues for several hours and the danger of dislodging the filling by premature finishing is great.

The finishing of the lingual aspect of a Class III restoration is done with a large round bur held lightly against the filling so that it will reduce the excess with a shaving operation. The labial and proximal aspects are reduced with Bard-Parker scalpels no. 12 and 16, used in the same manner as a gold finishing knife. The cervical restorations are finished with a plain cut fissure bur. The scratches and knife blade marks are removed with a fine sand paper disk; the disk must be kept wet to avoid the development of heat, which would readily soften the filling and might discolor it. Additional finishing can be done with pumice and a wet brush, but the use of abrasives should be kept to a minimum. In most cases a dull finish is to be preferred to a highly glossed finish.

CONCLUSION

It is obvious that the direct filling resins do not meet all of Black's primary and secondary requirements for a filling material; but neither do any filling materials now available.

Clinical evidence[18] indicates that the resins are not comparable to gold foil and amalgam as a restorative material but that they may have enough merit to be used when a cosmetic effect is important, that is, provided that continued clinical observation does not show excessive leakage and recurrence of caries.

In these days of striking developments in the field of chemistry, the following improvements in the resins may be anticipated:

1. A coefficient of thermal expansion more comparable to that of tooth structure.
2. Adhesion to tooth structure.
3. Anticariogenic properties.
4. Color stability.

18. Coy, Herbert D. Plastics in the field of operative dentistry: teaching and present status. J.D. Educ. 17:41 Jan. 1953.

Observations on the dental treatment of cerebral palsied children

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The dental treatment of the cerebral palsied child has been long neglected, and in most cases where treatment has been rendered it has been only of an emergency nature. Recently this need has been recognized as a special problem and as an obligation of all dentists.

In 1951, two, two-year dental fellowships were established at the Columbia University School of Dental and Oral Surgery under the direction of Solomon N. Rosenstein, head of the division of pedodontics. These fellowships include a program of study of the medicodental aspects of the problem; a complete outpatient service at the Columbia University Dental School serving patients from the cerebral palsy clinic at Columbia-Presbyterian Hospital and patients from cerebral palsy clinics in metropolitan New York; an inpatient service at the St. Giles Hospital in Garden City, Long Island; and a research plan for the development of technics and aids for the dentist in the handling of the children.

SPECIAL DENTAL PROBLEMS

All of the classified types of cerebral palsied children were treated at the above facilities. These included the athetoid, spastic, ataxic, tremor and rigidity types.

In addition to the normal pedodontic problems, the child with cerebral palsy has many difficulties superimposed.

Because of the involvement of the facial muscles and muscles of mastication, the normal chewing pattern is disturbed. This often eliminates from the diet many of the foods which act to cleanse the teeth and oral tissues. The tendency on the part of the parents is to give the children soft, starchy foods rather than coarse fibrous ones which are necessary for good cleansing and exercise.

The dyskinetic movements of the arms, cheeks, lips and tongue cause an inability to perform the necessary functions of mouth hygiene properly. The accumulation of debris leads to a greater prevalence of decay.

Poor mouth hygiene also leads to a much greater percentage of periodontal problems than is seen in normal children. Many of the children receive drugs such as diphenylhydantoin sodium which causes hypertrophy of the gingival tissues and accompanying periodontal difficulties.

In patients with disturbances of the facial, masticatory and tongue musculature, varying degrees of orthodontic involvement are found. The athetoid patients often develop an Angle Class II malocclusion which seems to be due to several factors. One of these is tongue-

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thrusting which is caused by a faulty swallowing reflex. This tends to push the upper anterior teeth labially giving them a noticeable overjet. There also appears to be a neuromuscular syndrome which constricts the upper arch and facial bones causing a startling similarity of appearance in many of the children.

The constant grinding movements of the jaw may cause severe attrition of the occlusal surfaces of the teeth with a resultant loss of vertical dimension and closure of the bite.

DIFFICULTIES IN TREATMENT

There are problems in the treatment of the cerebral palsied child which are common in any phase of dental treatment. Along with these are specific obstacles which arise in specialized treatment of certain difficulties. In the cerebral palsied child there are still more requirements which must be met before adequate treatment can be rendered. Many of the patients have extraneous dyskinetic movements of the entire body making stabilization a prerequisite to effective dental treatment. Grimacing, drooling and spasmodic movements of the jaw further complicate the problem. Hyperactive reflexes require that the dentist exercise extreme care in instrumentation for his own as well as the patients' safety. Very often, without volition, the patient will suddenly clamp his jaws together, or have muscular spasms in other parts of the body. The gag reflex is hyperactive in most of the cerebral palsy patients.

In orthodontic treatment various habits and functional disorders must be corrected first before successful results can be obtained. Among these habits is tongue-thrusting, mouth breathing, and others which act to distort the occlusion.

Increased salivation and poor mouth hygiene result in massive accumulation of calculus with the resulting periodontal involvements which are difficult to resolve.

An important aspect in rendering treatment, not of a mechanical nature, is the problem of the behavior of the children. The overprotective environment created by the family makes this understandable.

SPECIAL AIDS

The stabilization of the patient may be achieved through the use of several methods. The positioning of the chair is extremely important as an aid in securing the patient. It should be tilted back which will prevent the patient from sliding forward or falling as well as instill a feeling of security. Special canvas ties may be improvised which attach the braces to the chair and the waist or shoulders to the back rest. A shoulder harness with which the dentist supports the patient and achieves more control over involuntary movements may be used. If the movements are such that they cannot be controlled adequately, sedative drugs like the short-acting barbiturates may be used as an adjunct. Several drugs are being studied at this time.

In operative procedures the use of an ordinary metal thimble covered with a rubber finger cot acts as a mouth prop as well as a protective device for the operator and patient. It should be stabilized against the stationary upper jaw, lessening the chance of dislodgment. Rubber mouth props or a rachet-type prop may be employed as accessories in keeping the mouth in an open position. Metal mouth mirrors should be used to eliminate any possibility of breakage of a glass mirror in the event of a sudden spasmodic closure. Diamond stones are employed in cavity preparation to lessen the danger of tissue laceration. A trained dental assistant is of the utmost value to the operator in anticipating all of his needs so that his attention is never drawn away from the patient. During all procedures the diligent use of an aspirator is a necessary aid.

SUMMARY AND CONCLUSIONS

The dental needs of the cerebral palsied child cannot be stressed too strongly. These requirements, important in the unhandicapped child, are especially necessary in these children. They frequently have impaired masticatory function. A healthy dentition will promote normal mastication and help prevent impaired function resulting from lack of proper care. This improved function helps to insure a high nutritional level to meet their large energy requirements. The integrity of the dental apparatus is important for proper jaw development and for normal speech. Also the esthetic considerations and psychological aspects must not be minimized.

After treating approximately 150 cerebral palsy patients we feel that the majority of them can be properly cared for, using the aids and procedures described which may be readily adapted to the dental operating room. With an intelligent understanding of the problem, patience and perseverance these children can be treated successfully.

The effect of cusped tooth forms on denture stability

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The success of complete artificial dentures is dependent on a preponderance of stabilizing factors over displacing elements. In every denture problem there are some conditions which can be used by the dentist to provide stability and other conditions which permit or create mobility of the denture bases. Some of the displacing elements are uncontrollable; others can be regulated.

Accepted principles of denture construction utilize the following factors to produce stability of the denture bases: (1) denture base delineation, (2) denture form, (3) tissue contact and (4) occlusal balance in function. Proper base delineation provides support on larger and more stable areas. It can also eliminate displacing factors of the border musculature. Good form of the dentures allows facial tissues to grip the dentures and to hold them in position; further stabilization for the lower denture is provided by the tongue if the lingual surface of the lower denture is properly shaped. Tissue contact permits adhesion and atmospheric pressure to supply constancy of position of the bases. All these stabilizing factors may be offset by an insufficient occlusal balance in centric and eccentric occlusal relations.

Since the presentation of Bonwill's "three point contact" scheme of balanced occlusion, the dental literature has been filled with methods and procedures to produce stability of denture bases by means of establishing tooth to tooth contacts between the maxillary and mandibular dentures in the eccentric positions. Laws and rules of articulation of

teeth were developed by authorities in the prosthetic field. Although they differed in their approach and methods, their goals and principles of articulation were similar. The principles of articulation were implemented by the use of cusped tooth forms, but a disregard of these principles of articulation by members of the profession put the cusped tooth form in disfavor. It was observed that artificial dentures constructed with cusped tooth forms could articulate with great accuracy when first placed in the mouth; but after these dentures were settled into a functional position, cuspal interference was evident. Cuspless tooth forms of various occlusal patterns were developed to eliminate cuspal interference. When they were used in conjunction with a technic which did not register eccentric relations, these cuspless tooth forms of occlusal patterns caused less occlusal obstruction in eccentric positions of the mandible than did the cusped tooth forms; but they did not provide sufficient interdigitation in centric occlusal relation. After the dentures settled into a functional position, good tooth to tooth contact in centric occlusion was lost; and a protrusive relation of the mandibular denture to the maxillary denture developed. If the anterior teeth of these dentures were set with some degree of vertical overbite, a more severe displacement occurred than if cusped tooth forms had been used.

OCCLUSAL BALANCE

A cusped tooth form is necessary to create the maximum of balance in eccentric positions of the mandible. Such tooth forms must be so arranged that they conform with the accepted rules of articulation. For the purpose of clarity, the most important elements of occlusion may be divided into fixed and alterable factors. The fixed factors are: (1) the position of the mandibular centricity, (2) the inclination of the condylar path and (3) the Bennett movement or lateral shift of the condyles.

The position of mandibular centricity is unalterable. Most prosthodontists agree that in centric occlusion the condyles are in their most posterior position from which lateral movements can be made. The inclination of the condylar path also is unalterable. The condylar path first observed in a patient cannot be changed except by surgery or injury. Neither can the directions of the Bennett movement be altered. The Bennett movement and the condylar path play an important part in the determination of the position and height of the various cusps.

The alterable factors are: (1) the incisal guidance,[1] (2) the inclination of the occlusal plane[2] and (3) the curve of Spee.[3] An understanding of the interrelation of the fixed and alterable factors is necessary to obtain a clear picture of the role a cusped tooth form plays in the production of good articulation.

The slant of the incisal plane is determined by the relative position of the lower incisor teeth to the upper incisor teeth. In most cases, esthetic requirements demand some horizontal and vertical overbite of the anterior teeth. An increase in the vertical overbite will increase the slant of the incisal plane. A decrease in the horizontal overbite also will increase the slant of the incisal plane. In like manner, a decrease in the vertical overbite will decrease the slant of the incisal plane, and an increase in the horizontal overbite will decrease the slant of the incisal plane. Moreover, a decrease in the incisal slant will decrease the height of the cusps of the posterior teeth. Variation in the inclination of the occlusal plane is limited posteriorly only by the

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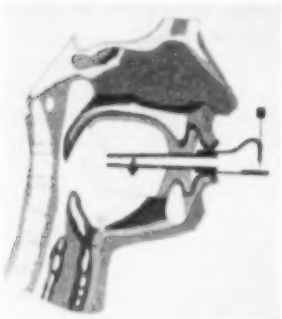

Right: Frontal view of displaced baseplates. Note lateral shift of maxillary base to right and of mandibular base to left

Fig. 1 • Above left: Sagittal view of displaced baseplates. Note shifting of upper and lower bases into anterior position, causing intrusion of bases into rugae of maxilla and lingual surface of lower ridge. Note also that labial flanges of maxillary and mandibular bases are advanced forward and out of contact with labial surfaces of ridges

intermaxillary space and anteriorly by the height of the mandibular cuspid. An increase in the slant of the occlusal plane likewise decreases the cusp height of the posterior teeth. A decrease in the diameter of the curve of Spee also decreases the cusp height. It is evident that the alterable factors of occlusion may be used to advantage to lower the cusp height of artificial teeth and still maintain occlusal balance. Although lower cusp height tends to lessen lateral displacement, it has its disadvantages also. There are two principal disadvantages. It is more difficult to maintain intercuspal interdigitation in centric occlusion with low-cusped tooth forms; and furthermore, they are less efficient than higher-cusped tooth forms because they require greater power to do the same work with the same number of strokes.

HORIZONTAL SHIFTING OF DENTURE BASES

A consideration of the effect of cusp height on the horizontal shifting of denture bases must include not only an evaluation of the resultant direction of force, due to positions of inclined planes of the contacting cusps, but also of the amount of force necessary to penetrate a bolus of food. During mastication, at the time that the artificial teeth are penetrating the food and before they actually make contact, the amount of force used to penetrate a bolus of food is dependent on the cutting efficiency of these teeth. At this stage of mastication, horizontal shifting of denture bases depends on the amount of force exerted, the fit and delineation of the denture bases, and the ability of the patient to position the mandible so that the bases balance on their ridges. After the teeth have penetrated or almost penetrated the bolus of food, the occlusal surfaces of the teeth play an important role in stabilizing or disrupting the position of the denture bases on their ridges. If the teeth are arranged to allow freedom of movement from eccentric positions of the mandible to centric position and at the same time to provide for a balancing contact of the teeth on the opposite side, a minimum horizontal shift of the bases will result. It must be kept in mind, that this moving interdigitation of maxillary and mandibular teeth must be in effect when the bases are in their functional positions, that is, the positions in which the bases seat themselves while under stress.

FUNCTIONAL OCCLUSION

The supporting mucoperiosteum is displaceable under every denture base to a varying degree. When the bolus of food is between the teeth and force is exerted by the muscles of mastication, that force is transmitted to the denture bases, which subsequently assume a functional position relative to their bony supports.

If centric and eccentric relations are recorded by means of conventional methods, which include recording under a minimum of stress, the teeth will be arranged to occlude when the denture bases are in a nonfunctional position on the ridges. When the forces of mastication are exerted on the denture bases and they take a functional position, the teeth which were arranged to occlude when the bases were in a nonfunctional position will no longer interdigitate properly in the centric and eccentric occlusal positions. In like manner, if the mandibular positions are recorded under unequalized stress, the teeth will be so arranged that they will occlude properly only when the denture bases are in displaced positions on their respective ridges (Fig. 1).

THE EQUILIBRATOR

After such displacement had been observed for many years, an instrument was developed to register centric and eccentric relations under functional stress and at the same time to equalize that stress. This instrument consists of a completely enclosed hydraulic device mounted on the lower baseplate and a striking plate mounted on the upper baseplate (Fig. 2, above, left and right). Emerging from the hydraulic device are four contacting rods, one on each side in the bicuspid region and one on each side in the molar region. These rods are extensions of pistons which function within cylinders located in the body of the instrument. All cylinders are connected with one another and with the master cylinder by channels. The master cylinder contains a master piston which functions by means of a thread on the inside of the cylinder. By the rotation of the handle of the instrument, the master piston is advanced and forces the fluid against the four smaller pistons in their four cylinders (Fig. 2, below). Since the pressure on these pistons is equalized because of the fluid nature of the device, the instrument provides a means for registering an equilibrated functional relation of the mandibular denture base to the maxillary denture base.

The technic for the use of the equilibrator is essentially the same as any procedure used to obtain a plaster or artificial stone check-bite (Fig. 3, above left). The central bearing pin is out of contact with the striking plate on the upper baseplate when the check-bite is recorded. The striking plate is raised from the central bearing pin by the contacting rods of the equilibrator when the fluid in the hydraulic system is advanced by turning the knob of the master cylinder. While the plaster or stone is setting, the patient is instructed to create sufficient pressure to push out the indicator pin which protrudes from the center of the knob of the master cylinder. As in the conventional technics, these steps in the procedure are executed with the Gothic arch tracing pins at the apexes of the arrow point tracings when centric relations are obtained and on the segments of the tracings when eccentric relations are registered (Fig. 3, above right, center and below). There is no need to raise the central bearing screw for eccentric registrations. Within the contact area of the central bearing screw, the striking plate has an inclined plane which provides for an opening component during the lateral and protrusive excursions of the mandible. This inclined plane in no way affects the seating of the baseplates because, as already stated, the central bearing pin is out of contact during the time of registrations.

COMMENT

The height of cusps on the occlusal surfaces of cusped tooth forms can be reduced by adjusting the slants of the incisal and occlusal planes and still maintaining occlusal balance; however, the cusp form should not be too blunt. The increased amount of force necessary to penetrate a bolus of food offsets the advantages of a lower cusp, since the pain caused in the tissues supporting the denture bases limits the amount of force the patient will apply and there is a resultant lack of masticating efficiency.

Occlusal balance with denture bases in a nonfunctional position on their supporting tissues does not perform its purpose; that purpose cannot be achieved without shifting the bases and thus causing trauma.

Clinical evidence supplies proof that

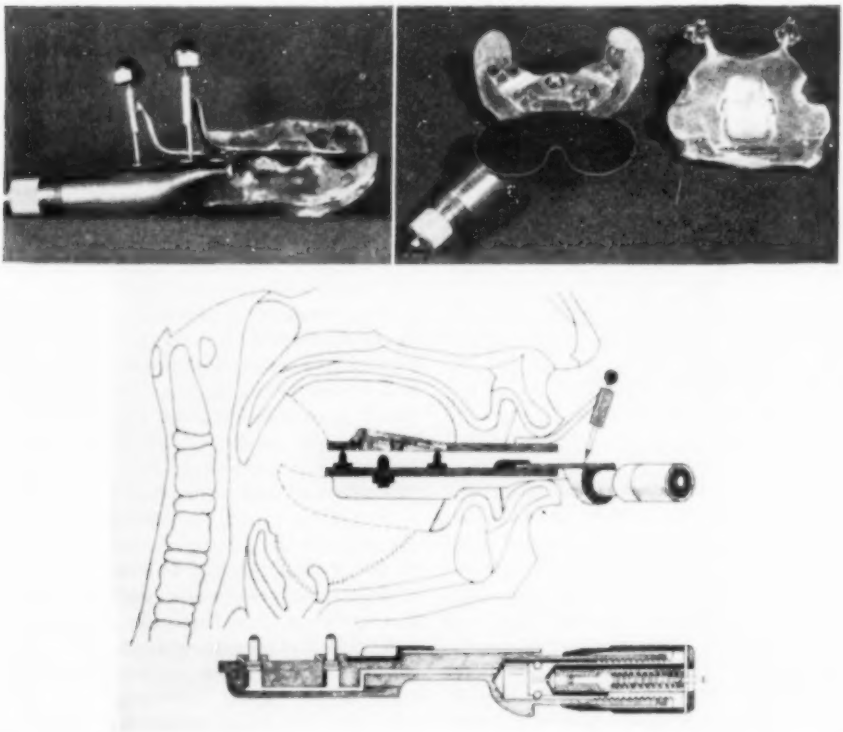

Fig. 2 • Above left: Equilibrator. Above right: Completely enclosed hydraulic device, fitted with double scribing plate mounted on lower baseplate; striking plate, fitted with two scribing pins, mounted on upper baseplate. Below: Equilibrator in mouth. Note that central bearing rod is out of contact with striking plate on upper baseplate when equilibrating rods are in function. Insert in lower part of drawing: Cross section of equilibrator. Emerging rods, two on each side, are extensions of pistons which fit into respective cylinders. Cylinders and master cylinder are connected by channels. Piston of master cylinder is drilled through to receive smaller piston within. Extension of smaller piston indicates pressure exerted by contacting rods on striking plate

denture bases do settle on their supporting tissues after they have been in use, in many cases, after short periods of time. The amount of settling is in direct proportion to the degree of displaceability of the supporting tissues. Proof that this observation is common throughout the profession is provided by the number of technics which are advocated to correct such a condition. These technics, based as they are on methods of securing registrations in wax after the dentures have settled, run the risk of adding error to error: the dentures may be settled in unfavorable positions on their supporting tissues, and the materials with which the new registrations are made may be unreliable in their equalizing effect. After new records are made and the dentures are mounted in an articulator, it is difficult, if not impossible, to grind the teeth into a balanced occlusion.

The use of cusped tooth forms or cuspless forms of occlusal patterns will not eliminate the unstable equilibrium created

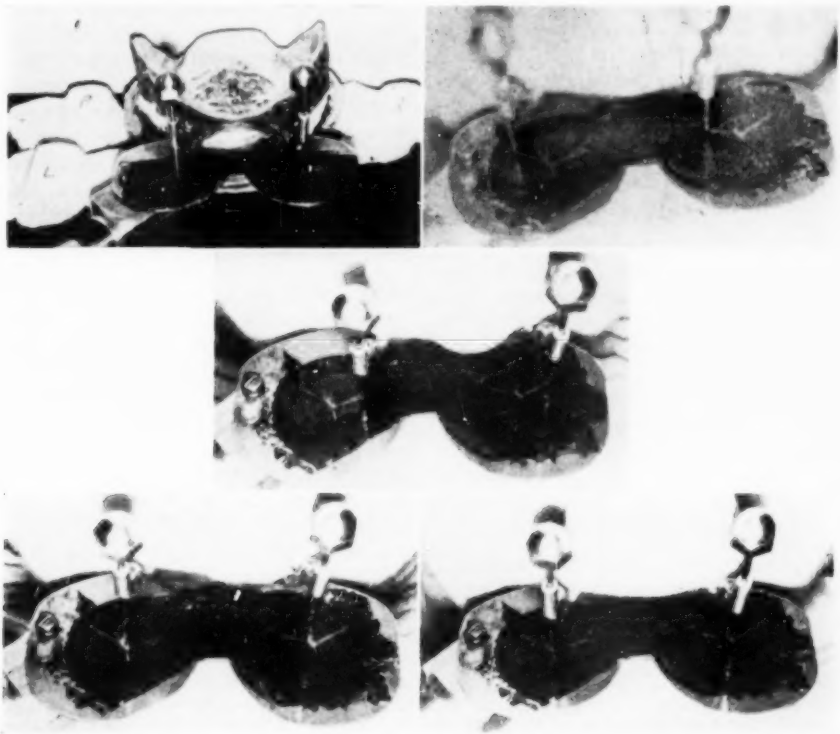

Fig. 3 • Above left: Recording check-bite with equilibrator. Above right: Left lateral relation of mandible to maxilla while baseplates are seated in equilibrated, functional position. Center: Right lateral relation. Patient maintains this relation under functional stress while plaster check-bite is setting. Below left: Protrusive relation. Below right: Centric relation. While creating functional stress, patient is able to hold both scribing pins at apexes of Gothic arch tracings because of equalizing effect of equilibrator

Fig. 4 • Above: Protrusive relation. Note balancing contacts of posterior teeth. Above center: Right lateral relation. Note low cusp height of teeth

Above: Left lateral relation. Note balancing contacts on right side. Left: Centric relation. Note horizontal and vertical overbites

by denture bases which are constantly shifting from a nonfunctional position to a functional position.

The equilibrator was designed to permit the dentist to register maxillomandibular relations while the denture bases are in functional positions and at the same time to facilitate indexing those relations by equalizing intermaxillary stress.

The photographs of Figure 4 show complete upper and lower artificial dentures which have been worn constantly for over two years. These dentures were equilibrated under functional stress. They exhibit the same occlusal balance now as they did when they were first placed in the mouth.

1203 Selling Building

The Limitations of Senses • The senses are clever, but they miss the greater part of what is going on. C. Judgson Herrick has prepared a table in his *Introduction to Neurology* which indicates the alarming number of things of which our senses are unaware. The skin is sensitive to mechanical vibrations up to 1,552 per second, but beyond that point feels only a steady push. The ear is aware of sound traveling by wave lengths of 13 mm. up to 12,288 mm. but does not hear sounds below or above these limits. Some animals have a wider sound range. The skin is aware of heat waves only from .0008 to .1 mm. long. The eye takes cognizance of light waves from .0008 mm. to .0004 mm., but misses electric waves, ultra violet rays, x-rays, gamma rays, and cosmic rays running from wave lengths of .0004 to .000000000008 mm. A biologist tells me on a rough estimate that the eye sees about 1/12,000th of what there is to see. *Stuart Chase, "Tyranny of Words," 1938.*

Health conservation for the private practitioner

Leonard F. Menczer, D.D.S., M.P.H., Hartford, Conn.

Probably no phase of dental practice has been more neglected by the dental practitioner than conservation of his own health. Yet there are few professions that take a greater toll of the physical and mental resources of the individual than the profession of dentistry.

In the clinical routine of the dentist there are many "malpractices," that is, unreasonable physical demands on the human body. By the elimination of these malpractices not only would the health and welfare of the dentist himself be promoted, but his contribution to public health would be greatly increased.

Used singly or collectively, four auxiliaries to the clinical routine are of considerable value in reducing the physical exertion and the mental strain of the dentist: (1) the dental assistant, (2) the dental operating stool, (3) adequate lighting and (4) a preoperative sedative. It is true that the adoption of some of these aids necessitates the learning of a new set of coordinated movements which temporarily may use precious time and cause fatigue. A few days or even a few weeks spent in adapting oneself to a new way of work are of little importance compared with the time and energy that may be saved in 25 to 35 years of professional practice.

THE DENTAL ASSISTANT

Auxiliary workers, such as the dental assistant, the dental hygienist and the dental technician, have been employed for over 85 years.[1-3] In the past, however, the dental assistant has been employed primarily to save the dentist's time only. She can serve equally well as a chair assistant to reduce his fatigue and conserve his strength.

For efficient operation, a busy dental practice may require the employment of a jack-of-all-trades, the receptionist-secretary-bookkeeper-order clerk, in order to free the dental assistant for chairside duty. The properly trained dental assistant[4] can perform innumerable movements for the dentist, reducing his mental and physical strain possibly by half and increasing his productive capacity 35 to 75 per cent.[5]

The U. S. Public Health Service, in its dental restorative demonstration programs both at Woonsocket, R. I., and at Richmond, Ind.,[6] has developed the dental assistant's role to perhaps its maximum level.

THE DENTAL OPERATING STOOL

"How you can operate sitting down and live longer" is the statement one manu-

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facturer makes to express the advantage of the dental operating stool. Another refers to it as "the dentist's fatigue chaser." Possibly the greatest occupational hazard in dentistry is back and leg strain, caused by excessive standing, usually in one spot and frequently on one leg. The abnormal body activity involved in these positions and in the routine torso contortions of the dentist in his work may be predisposing factors in various foot, leg and back disorders. Such activity aggravates conditions such as circulatory disorders of the leg, lumbosacral disorders and disorders of the bony-ligamentous structure of the foot. Cecil and others[7] state that varicose veins are caused by "constitutionally defective valves in association with postural strain, usually of occupational type."

Howorth[8] states that the lumbosacral joint is subject to considerable mechanical strain. The mechanical weakness of this joint plus the abuses to which man subjects it is responsible for the frequent occurrence of pain in the lower part of the back. Other factors listed by Howorth as causes of lower back pain are improper shoes, poor posture and occupations which cause severe strain or chronic fatigue. Shands and Raney[9] state that disabilities of the foot are extremely common; they list as predisposing causes of foot strain incorrect shoes, inadequate muscular and ligamentous support, excessive body weight and—what is most applicable to the dentist—too much standing.

The dentist can avoid much back and leg fatigue and the consequent nervousness and irritability by sitting comfortably during the routine of normal treatment. Although continuous sitting is possible only if the dentist has a dental assistant, a well-designed office makes possible prolonged periods of sitting and thereby the elimination of much of the strain and fatigue caused by continuous standing.

The U. S. Public Health Service in its demonstration programs at Richmond, Ind.,[6] and Woonsocket, R. I., has found that for most routine dental work a sitting position to the right rear of the patient, with the dental chair tilted backward, provides good visibility and access to the four quadrants of the mouth. The author, however, prefers two chair positions: (1) a sitting position to the right front of the patient for work on mandibular teeth and (2) for treatment of maxillary teeth, a sitting position just right of the center and behind the patient, with the dental chair tilted backward. The dental cabinet is within arm's reach in either position.

From correspondence with the five leading manufacturers of dental operating stools,[10] it is estimated that between 25 and 45 per cent of the practicing dentists use some type of operating stool. One manufacturer estimates that there are 40,000 stools in use in the dental offices in the United States. This does not mean that 50 per cent of the practicing dentists have dental stools, for many dentists have more than one treatment room. Based on the figures of 115,000 dental treatment rooms and 40,000 stools, the percentage of dentists who have stools is approximately 35 per cent.

It is estimated that between 5,000 and 7,000 dental stools are sold annually in the United States. Since many are purchased by the Armed Forces and by federal, state and city governments as well as by members of the medical profession, the number destined for the private dental practitioners cannot be estimated. It is encouraging to learn that some of the dental schools are requiring the use of the stool in dental practice. The dental operating stool has its place in the

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practice of dentistry for the reduction of fatigue and the maintenance of the efficiency and well-being of the practitioner.

ADEQUATE LIGHTING

Since the dentist spends approximately half his waking hours working under artificial illumination, adequate lighting is essential from the standpoint of his health and of the accuracy of his work. Faulty illumination and excessive use of the eyes cause muscular tensions which contribute to irritability and mental tension and result in a decrease in efficiency and accuracy of work.

Regardless of intensity, lighting is not satisfactory unless it is free from glare, either direct or indirect, for glare and inadequate lighting produce similar discomforts.[11] Furthermore, the contrast between the general illumination of the dental treatment room and the localized illumination for intraoral work should not be too great, since switching vision from bright intraoral lighting to dull room light, as the dentist must do frequently, is a cause of serious eye fatigue. Proper general lighting, therefore, should be regarded as an essential part of office equipment.

Not only is adequate artificial illumination of importance, but indeed all the physical aspects of one's surroundings have a significant effect.[12] Attention must be directed to painting and decoration, to daylight control, to artificial lighting replacing daylight, to heating and ventilation. These factors, routinely considered for the welfare of the child in the classroom, could well be studied to provide for the welfare of the dentist in his office.

A PREOPERATIVE SEDATIVE

At times, even under normal circumstances with the ordinary demands on the practitioner, a day at the office is fatiguing. When there are recalcitrant or apprehensive patients, the dentist may reach such a physical and emotional state that he cannot render efficient service to his patients.

One means of minimizing emotional stress for dentists and for patients is to administer a preoperative sedative to patients with a low threshold of pain and to apprehensive patients who cannot endure the thought of cavity preparation. In regard to children, "more dentists would practice for more children if they did not question whether the good done a child patient were worth the emotional disturbance inflicted on both the child and dentist."[13]

The routine use of barbiturates in dental practice for apprehensive and difficult patients was discussed as early as 1945 by Andersen[14] and the use of secobarbital sodium for infants and children as early as 1943.[15] If an anesthetic is to be administered, the use of a sedative facilitates the injection of a local anesthetic and reduces the amount of drug required for analgesia or for general anesthesia.

SUMMARY

It is paradoxical that the members of the dental profession, engaged in the preservation of the oral health of the American public, neither as individuals nor as a profession make any adequate attempts to conserve their own physical and mental resources.

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Four adjuncts to dental practice which can materially reduce physical exertion and mental strain are: (1) the dental assistant, (2) the dental operating stool, (3) adequate office lighting and (4) a preoperative sedative. Put into practice, these aids will increase the dentist's productive capacity and help the dental profession meet the nation's demands for dental manpower.

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Improving immediate dentures in general practice

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If the dentist is to feel lasting satisfaction with the immediate dentures which he makes, their construction must be planned to give the patient long-range service. At present too many immediate dentures are planned for temporary service only. In many cases, therefore, the dentures give temporary rather than permanent service. The patient's apparently quick facility in using the immediate dentures, especially an upper denture, deceives many patients and dentists. Trouble manifests itself slowly with a hypertrophied anterior ridge, soreness and a loss in the stability of the dentures. Too often the dentist is confused about his final obligation to the patient. He seems to like the first phase of the work and to dislike the follow-up reconstruction. Consequently, the construction of many immediate dentures reaches only the insertion stage, and the dentures are never fully completed.

Neglect causing the failure of immediate dentures may occur in any of the stages in the process of construction: (1) instruction of the patient, (2) taking of the impression, (3) registration of initial centric bite relation, (4) maintenance of facial esthetics, (5) surgery, (6) remounting and grinding-in of occlusion, (7) relining and reconstruction.

FACTS AN IMMEDIATE DENTURE PATIENT SHOULD KNOW

The Disadvantages of Immediate Dentures • A careful consideration of the difficulties and disadvantages of immediate dentures is necessary in order to assure success and satisfaction for the patient and for the dentist. The patient should be prepared to meet the additional expense and time involved. Immediate dentures usually need to be rebased or duplicated within a few months. If the patient does not understand about this additional work in advance, the dentist and patient are likely to have some misunderstanding when these changes become necessary.

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The task of immediate denture construction is not as simple as it has often been claimed to be; a large number of office visits are required because during the first few months the dentist must watch the changing bite which results from the uneven shrinkage of the tissues.

The Advantages of Immediate Dentures • Among the advantages of an immediate denture are the following:

1. The patient does not need to go through the humiliating period of healing. This advantage is especially important to the patient concerned with his business and social prestige.

2. There is usually less pain because the denture acts as a protecting splint for the open wounds and thus aids healing. The patient is recovering from the shock of a surgical operation and learning to manipulate the denture at the same time. In the former customary denture procedure, the pain and the inconvenience had to be endured in two separate stages.

3. Facial appearance is less affected because there is less change in muscle and supporting structures and the jaw opening is maintained.

4. The patient is not so inclined to jeopardize his health by retaining infected teeth too long because he does not have to be edentulous for a long period, as a patient usually must be during the ordinary construction of dentures.

5. There is likely to be more lasting stability and better tissue resiliency. Edentulous mouths without a protective covering lose tissue softness; and bone resorbs more rapidly when there is no stimulation supplied by the denture base for the maintenance of the tissues.

6. There is less difficulty in repositioning the surrounding structures because there is no need to counteract either the spreading of the tongue, which occurs when the tongue is not restrained by contact with the teeth, or the falling in of the cheeks, which occurs when the patient is without teeth for a long period of time.

7. The greatest art is to conceal art; the dentures are less noticeable if the teeth are placed in the identical positions of the natural teeth. With immediate dentures, it is possible to have the same dental arch contour, the same dental arch position, the same size and shape of the teeth, and the same individual rotational positions and inclinations that the natural teeth possessed.

IMPRESSIONS

The use of an unaltered stock tray in the taking of impressions for immediate dentures will cause failure because its proportions are not suitable: the height is insufficient, the incisal fossa is not undercut deeply enough, the buccal flange is too high. Furthermore, in most of these trays sufficient space has not been provided for the tuberosity. Therefore, a snap cast on which a suitable tray can be made or altered is a necessity if an acceptable final impression is to be attained.

The operator has two choices in the type of tray he can use. He may use an acrylic tray processed over the snap cast; or he may use a stock tray, lengthening it with wax, bending it back into the incisal undercut and shortening it on the buccal flange by cutting down the height. The tray is bent to increase or to decrease the width. A wax that is soft and adhesive enough to be adapted by finger pressure is added to the metal tray to increase the height, to decrease the width and to lengthen the posterior border. It can be used also to close perforations in order to aid in confining the alginate material.

A well-trimmed tray, adapted as to height and width and designed for the confinement of the impression material, will take a good impression if it is filled with a properly timed and well-mixed

alginate or hydrocolloid. If hydrocolloid is used, the tray must be trimmed with compound because the heat of this material would melt the wax. Hydrocolloid requires the least exactness because the mix is predetermined; however, the chilling time must be clocked.

An alginate is the material of choice; hydrocolloid may be more convenient and is acceptable. If alginate is used, it should be realized that it can be abused to the point of being inaccurate. At this stage of the procedure, an extremely slight difference in skill and in timing produces a great difference in the accuracy or inaccuracy of the results. The water and powder must be measured with care and well spatulated; there must be no guessing as to the setting time. The operator should acquire the habit of setting a timer. The x-ray timer or a cookstove timer will clock the mixing and the setting time.

BITE RELATION

The bite relation of an immediate denture is the same as that of a free saddle partial denture. Errors occur readily in establishing both relations. If excessive grinding is necessary in order to correct the final bite relation of the completed denture, then the practitioner's knowledge and preparation for this jaw relation were insufficient. Often the failure to arrange sufficient time for this step results in such evidence of neglect.

Another cause of difficulty is the small normal space between the tuberosity of the upper jaw and the pear-shaped area of the lower jaw. Frequently this space has been decreased by extrusion of the upper posterior teeth before their removal. The extruded bone remains after extraction, thus diminishing the needed space.

The baseplate material is adapted with a double palate used for rigidity; a springy rim causes inaccuracy. The tray is thinned or cut open on the posterior crest and the area of the buccal space. This trimming of the baseplate material is done to allow working space during bite registration. The purpose of the wide clearance is to avoid any possibility of premature contact in this posterior region. The wax should not cover the full length of the edentulous space; instead, only a small cylinder of wax should be used in order to reduce the biting pressure which will lessen the tissue displacement.

Posterior tissue displacement is the cause of an open bite in the completed dentures. Some consider such an open bite to be caused by failure to close the flask. The difficulty usually occurs, however, from the filling and the compressing of the posterior region with cold wax and impression material during bite registration. Therefore, excessive final grinding can be eliminated if a well-fitting rigid rim is used and an unstrained centric bite is obtained.

ESTHETICS

The natural expression of the lower half of the face is dependent on the position of the dental arch. One of the advantages of immediate dentures is that it is possible to maintain the position of the arch in relation to all the structures of the head and therefore to maintain the facial appearance.

In order not to lose the exact relation of the teeth to the maxilla, the teeth should be cut off the cast one at a time and replaced one at a time. Individual irregularities but not the arch as a whole may be changed without destroying the relation.

Duplication of the teeth, as to desirable size, form, individual inclinations and rotations, and the arch position and form can be achieved only by removing one stone tooth at a time and immediately replacing it with porcelain. Furthermore, if the teeth are cut off and replaced in a group, the result is not as

satisfactory; and the saving of time is negligible.

SURGERY

There are four specific cautions to be observed in removal of teeth and reduction of the ridge:

1. The injection for anesthesia should not be by infiltration under the periosteum in the anterior peripheral denture-bearing region. Anesthesia should be produced by other methods such as general anesthesia, infraorbital injection or infiltration high above the reflection of the mucobuccal fold.

2. The periosteum should not be reflected more than 5 mm. Caution must be used in this part of the operation, because once the process of reflecting the periosteum is begun, there is little resistance and it is easy to reflect it too high. If the periosteum is reflected too high, the denture border will rest on scar tissue.

3. The anterior undercut must not be removed as it is in other parts of the mouth. To remove this anterior undercut narrows and destroys a valuable denture-bearing region. The denture can be inserted upward and backward into place, as the path of insertion need not be straight upward. Only enough bone should be trimmed from the lower outer edge to afford space for denture base material. The labial plate of bone should not be removed nor all the parts of the septa. Bicuspid undercuts if they are present should be removed at the same time that the anterior teeth are extracted.

4. One suture, placed to one side of the median line, is sufficient. Cutting through the papilla causes undue irritation because it is a region of the incisive foramen. Oversuturing is detrimental since it causes further irritation and soreness. Multiple tight sutures prevent the ridge from becoming full and rounded.

REMOUNTING THE FINISHED DENTURE AND GRINDING IN OCCLUSION

After the mouth has healed for a few days and the initial soreness has disappeared, a centric bite relation is obtained by the interocclusal wax method. The error of a pathologic, acquired centric jaw relation of the natural teeth is often carried over into an immediate denture. Such an error should be corrected at the time of the final grind-in of the occlusion.

A horseshoe-shaped piece of baseplate wax, approximately three layers in thickness, is placed over the occlusal surfaces of the mandibular teeth. This amount of thickness is chosen to insure a sufficient bulk of wax to eliminate the danger of the penetration of the wax and the resultant contact with the opposing teeth when biting pressure is first exerted and also to prevent the possibility that a chilled layer of wax next to the teeth might interfere with an equalized pressure.

This wax is luted into the interproximal spaces of the anterior and posterior teeth on the labial, buccal and lingual aspects. Before the wax is luted into position, the teeth and wax should be dried so that the luted wax will adhere firmly to the teeth. The surface of these three layers of wax is first heated with an alcohol torch. The flaming is done by moving the flame from side to side, allowing sufficient time for the heat to penetrate to the full depth of the wax. If this is not done, cold spots will be encountered; and there will be resultant unequal pressure on the tissues.

To insure further a uniform depth of softened wax for making the record, the occlusal portion is dipped into water of 135° F. for a few seconds, and the depth of heat penetration is tested with an instrument. The wax should be softened throughout; if it is not, the dipping should be repeated. With the thumb and the forefinger on the tip of the chin to guide the mandible into its most retruded

position, the operator instructs the patient to bite. This biting pressure should not be great enough to force the maxillary teeth through the wax. If the patient does not retrude the mandible by one method, another method should be tried. A minimum amount of biting pressure should be exerted on the wax by the patient. The patient should maintain light occlusal contact with the wax while this is chilling. Chilling of the wax may be hastened by squirting a small amount of cold water into the mouth onto the wax, or a cotton roll which has been dipped in ice water may be placed against the wax. After the wax is chilled, the denture is removed from the mouth and chilled. The occlusal wax indentations and the opposing teeth are dried, and the indentations are examined carefully.

The wax record should have indentations of all the opposing teeth in the wax. No opposing tooth should penetrate the wax to strike through to the occlusal aspect of any tooth. If this should occur, there would probably be a premature contact with its resultant evils: shifting of the base or a horizontal and vertical change in the maxillomandibular relation.

This first record is made in order to level the wax to the occlusal surfaces of the teeth so that the excess can be trimmed to give an even depth of wax throughout. This surface is again dipped in water of 135° F., and a new centric record is made in the mouth. The objective is to obtain shallow indentations made by all the teeth in the arch. Again, care must be taken that the patient does not bite through the wax. After the wax has been chilled, the denture is placed on the cast; and the articulator, with the upper member in its most forward position, is closed into these indentations to test whether the opposing teeth fit into the indentations in every way, anteroposteriorly, laterally and vertically. These teeth fit into these indentations with a surprising degree of exactness if the original bite and check are both correct.

If they do not coincide, the original mounting is incorrect, or the patient produced an incorrect relation when making this check-bite. Therefore, the surface of this wax record must be flamed again, the record dipped in hot water and reinserted in the mouth. Another attempt is made to force the mandible into its most retruded position while the patient closes into the wax. This record is tested again on the articulator. If the relation on the articulator and that on the new record coincide, the mounting is considered correct. If it does not check, the procedure in the mouth is repeated and the mounting tested on the articulator for the third time. If it does not check at this time, the mandibular cast should be separated from the mounting ring and remounted in accordance with the last interocclusal wax record. This new mounting is checked again in the same manner to test its correctness.

RELINING

There is little to be gained from rebasing dentures unless an exacting technic is used, which includes rechecking, remounting, resetting and regrinding the teeth. The question arises then as to the advisability of making a new case, inasmuch as a great amount of work is necessary for a complete rebasing service. The work involved is about half that required for a new case; however, the number of chair hours and patient visits is much smaller if the positions of the teeth are satisfactory.

The maxillary rebase impressions are difficult to make because the bite relations often have changed. The impression material inside the denture imperceptibly shifts the base, since it is difficult to make the impression material flow over this distance of denture-bearing area without distortion. In the mandibular denture, there is less danger of the shifting of the

base any significant amount; however, there is usually some change that requires remounting of the denture.

The impression material should be of a type that has a minimum amount of resistance and a long flowing time. For this reason, modeling compound is contraindicated as a rebase impression material. It is used only to extend short borders and to fill out undercuts. If the vertical dimension needs to be increased, it must be done, not with the impression material, but with interposed occlusal wax or compound. This vertical change is accomplished by resetting the teeth after the case has been mounted.

The idea that a denture can be corrected just by putting some impression material inside the denture and having it processed usually does not work out. A denture which is well-fitting in respect to tissue adaptation will not remain satisfactory if there are premature occlusal contacts. The stresses that are constantly exerted on the supporting structures because of this disharmony will cause the bone to resorb so that the denture will be ill-fitting again. Therefore, it is necessary to re-establish the correct occlusal relations at the time of making the new impressions. Tissue pressure and occlusal pressure are interacting, and their equalization is a vital consideration in any rebasing technic.

The success of immediate dentures is dependent on the maxillary denture. When this upper denture with its high ridges is filled with paste, a hydraulic lock often develops, which keeps it from seating properly. The improper seating often causes the shifting of the bite and the failure of the denture.

Compound is not to be used to correct the denture border because it changes the denture base during the impression procedure. Modeling compound should not be used either because it prevents an easy flow and thus makes proper reseating uncertain. If the borders are too high, they should be cut down; if too low, they should be raised with an adapting wax or a similar material. The paste material can be released by drilling from three to five holes in the palate in order to allow an easy seating of the denture base. If the centric bite relation appears uneven or high in spots, some occlusal wax should be luted to the teeth before the impression is taken.

The patient should practice assuming the most retruded position of the mandible and closing lightly. After the wax is softened, the patient assumes the retruded position of the mandible and bites lightly without piercing the wax.

A fairly thin mix of paste is made, and all the surface of the upper denture including the periphery is covered. The denture is inserted into the mouth and settled in place; the patient with slight momentary pressure bites into the indentations. After the patient ceases the pressure, he merely holds the denture in place lightly. Continued heavy pressure displaces the tissue and may spring the denture slightly so that the tissue may be distorted and the denture may spring back when released and cause an inaccuracy. After the denture is processed, it is tried in the mouth; and a new wax bite is taken for a new mounting on the articulator. No relined denture is accurate and complete without a new mounting and a new grinding, since the eye cannot detect the inaccuracies inherent in the processing. If the remounting is not performed, it is better not to do the relining.

No one claims that he can take a correct centric jaw relation every time, but every dentist can find out whether the relation is correct or incorrect. The mounting on the articulator is tested by removing the dentures from the machine, reheating the wax and placing the dentures in the mouth again with the patient closing his jaws in centric relation. This new test bite is tried on the articulator mounting to see if the dentures occlude in the wax. If it stands the test, the grind-

ing can be done. If not, the test must be repeated. If the test bite still does not check, it may be necessary to remount the dentures and repeat the process again. The operator must be prepared to spend two hours perfecting occlusal relations. This provision of the time is essential for the success of immediate dentures.

SUMMARY

The following are the most common points of neglect in the construction of immediate dentures:

1. Patient attitude. The practitioner fails to instruct the patient as to the cost, the process of construction and the results to be expected from the dentures. Frequently he neglects to inform the patient in advance of the necessity and cost of rebasing the dentures.

2. Impressions. Too frequently an inadequate impression is made because an unprepared, unaltered stock tray is used. A snap cast is necessary for a suitable tray adaptation.

3. Initial centric bite relation. Inadequate knowledge of a method and insufficient provision for the amount of time required for the initial accurate bite registration are common causes of difficulties. Improper preparation of the biterims results in the displacement of the soft tissue in the region of the tuberosity and subsequent open bite.

4. Esthetics. The natural favorable positions of the teeth are not reproduced if they are cut off the cast en masse instead of one at a time. Furthermore, facial expression is thus changed unfavorably. A natural overbite is necessary to maintain esthetic values but must be relieved, or unlocked, to prevent an unseating leverage.

5. Surgery. There is danger that too much bone of the labial plate may be removed. It is a mistake to attempt to remove the anterior undercut. An unnecessary amount of scar tissue is caused by retracting the periosteum too high. Pressure infiltration under the periosteum in the anterior flange area causes early soreness and later scar tissue. Harm is caused by excessive suturing.

6. Remounting and grinding in of the occlusion. The case must be accurately mounted and the occlusion corrected in accordance with this mounting.

7. Relining and reconstruction. The relining must be done carefully without too much delay, or it fails to function in maximum efficiency and comfort. A new centric bite relation must be taken, the denture must be mounted again, and this relation must be checked.

Man's Brain • I consider that a man's brain originally is like a little empty attic, and you have to stock it with such furniture as you choose. A fool takes in all the lumber of every sort that he comes across, so that the knowledge which might be useful to him gets crowded out, or at least is jumbled up with a lot of other things, so that he has a difficulty in laying his hands upon it. *Sherlock Holmes, A Study in Scarlet.*

The practical application of the New York University Dental-Medical Questionnaire

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In the technical skills of dentistry such great advances have been made that the present-day general practitioner can successfully perform all ordinary and many extraordinary dental operations. The nontechnical arts must keep pace with this technological advance in dentistry to supplement it properly. The adequate teaching of the medical aspects of dentistry is receiving increasing emphasis in dental curriculums. To enhance further the dentist's efficiency, a practical method of history-taking and evaluation is presented in this article.

Jean Nicholas Corvisant, an important figure in the history of physical diagnosis, remarked while viewing a portrait: "If the painter has been accurate, the original of this picture died of heart disease." On investigation, Corvisant's diagnosis proved correct.[1] To the untrained practitioner or student, ability such as this would seem an innate endowment or an art beyond his own ability. The frequency with which this type of snap diagnosis is erroneous, however, would make an interesting statistical study. It is neither the guess nor the sudden flash of brilliance that produces the diagnosis of greatest benefit to the patient but rather the carefully planned and systematic evaluation based on scientific information.

The medical practitioner is thoroughly trained in obtaining a case history. To form a diagnosis, he can resort also to examination by inspection, palpation, percussion and auscultation. The dental practitioner, however, must rely almost entirely on the patient's medical history, derived secondarily from the physician, for the evaluation of conditions outside the oral cavity. History-taking is thus even of greater significance to the dentist than to the physician.

Major states: "In some diseases, a physical examination is of great importance, while a laboratory examination is of little value; in other diseases the reverse obtains; but in all diseases the history is of great importance."[2]

The department of periodontia, New York University College of Dentistry, has devised a form for the rapid elicitation of a comprehensive history, including the patient's physical, mental and dental

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1. Major, Ralph H. Physical diagnosis, ed. 4, Philadelphia, W. B. Saunders Co., 1951, p. 1, 2.

2. Major, Ralph H. Physical diagnosis, ed. 4, Philadelphia, W. B. Saunders Co., 1951, p. 412.

health, as well as an adequate revelation of his present symptoms and complaints.

Many medical questionnaires, including the Cornell Medical Index[3-5] and the Massachusetts Health Questionnaire,[6] were studied with a view to adapting them to the dentist's use. These questionnaires, while well suited to medical and psychiatric studies, were not suitable for dental use. The New York University Dental-Medical Questionnaire was devised to place greater emphasis on dental history and to reveal those systemic conditions that might influence oral health. It is generally accepted that the existence of systemic disease may be the result of or may be augmented by oral diseases or aberrations. Systemic disease or debility may complicate local treatment, and medical care is frequently needed to insure a complete cure of the oral condition.[7]

The New York University Dental-Medical Questionnaire is a self-explanatory form. By its use a detailed and comprehensive medical history can be obtained quickly; one form, composed of 219 questions, is provided for men and another, composed of 233 questions, for women. Each question is worded in the vernacular of the verbal interview, and the patient merely circles a "Yes" or "No" response.

The questions are grouped according to the bodily systems and their symptoms in order to facilitate the patient's responses and the subsequent interpretation. The following are the divisions of the questionnaire in the order in which the groups of questions appear:

1. General medical history.
2. Family history.
3. Oral history and symptoms.
4. Eye, ear, nose and throat history and symptoms.
5. Cardiovascular history and symptoms.
6. Respiratory history and symptoms.
7. Gastrointestinal history and symptoms.
8. Genitourinary history and symptoms.
9. Gynecological history and symptoms.
10. Neurological history and symptoms.
11. Dermatological history and symptoms.
12. Joint and muscle history and symptoms.
13. History and presence of tumors.
14. Habits.
15. Psychological response to various life situations.

A few questions to which the normal response is affirmative are scattered throughout the questionnaire in order to check on the accuracy of the responses. To illustrate the type and content of the questions, pages 1 and 3 of one of the forms are reproduced from the questionnaire.[8]

The New York University Dental-Medical Questionnaire is usually completed by the patient during his first or second visit. Chair time is not utilized for this purpose; sufficient time immediately preceding or following the session is arranged. The average length of time needed to complete the questionnaire is 15 minutes, 25 minutes being the longest recorded time required. The patient should be seated alone and be left undisturbed in a quiet room while completing the questionnaire. At the present time

3. Welder, A., and others. Cornell service index: a method for quickly assaying personality and psychosomatic disturbances in men in the armed forces. War Med. 7:209 April 1945.

4. Welder, A., and Wechsler, D. Non-projective personality tests: the Cornell Indices and the Cornell Word Form: results. Ann. New York Acad. Sc. 46:579 July 30, 1946.

5. Welder, A., and others. The Cornell Index: a method for quickly assaying personality and psychosomatic disturbances, to be used as an adjunct to interview. Psychosom. Med. 8:411 Nov.-Dec. 1946.

6. Massachusetts Health Questionaire. Printed chart. Commonwealth of Massachusetts.

7. Miller, S. C., and Blass, J. L. A new periodontia record chart. J. D. Educ. 5:31 Oct. 1940.

8. Copies of the New York University Dental-Medical Questionnaire can be obtained from the department of periodontia, New York University College of Dentistry.

N.Y. UNIV. UNIVERSITY COLLEGE OF DENTISTRY
DEPARTMENT OF PERIODONTIA
DENTAL-MEDICAL HISTORY

FOR WOMEN

Name: (please print) Date:

Address:

Telephone:

Referred by:

Family Physician's Name:

Address:

Telephone:

Date Of Last Physical Examination:

Your Physician's Findings:

What is Your Present Dental Complaint?

Please Circle Appropriate Answer To Each Question.

A

1- Are you under a physician's care at present? Yes No

2- Do you take any medicine at present? Yes No

3- Have you ever had anemia (thin blood)? Yes No

4- Were you ever treated for venereal disease (bad blood)? Yes No

5- Do you have diabetes (sugar disease)? Yes No

6- Has anyone in your family ever had diabetes? Yes No

7- Did a doctor ever say you had a goiter? Yes No

8- Did a doctor ever treat you for tumor or cancer? Yes No

9- Have you any long-continued chronic disease, or infirmity? Yes No

10- As a child, did you ever have rheumatic fever, growing pains? Yes No

11- Have you ever had malaria? Yes No

12- Have you ever had typhoid fever? Yes No

13- Have you ever had celiac disease? Yes No

14- Is your mother living and well? Yes No

15- Is your father living and well? Yes No

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46- Do dental treatments cause you much concern or worry? Yes No

47- Can you relax during dental treatment? Yes No

48- Are you wearing dentures or removable bridges at present? Yes No

49- If above answer is yes, have you been able to wear dentures or removable bridges comfortably? Yes No

50- Have you ever had a reaction to penicillin or other medicine? Yes No

51- Did a dentist or physician ever tell you not to have an injection for dental work? Yes No

52- Did you ever faint in a dentist office? Yes No

C

53- Do you suffer from a running nose? Yes No

54- Are you troubled with frequent or severe sneezing spells? Yes No

55- Is your nose continually stuffed up? Yes No

56- Do you breath through your nose? Yes No

57- Have you had frequent or severe nosebleeds? Yes No

58- Do you have to clear your throat frequently? Yes No

59- Do you have sore throat frequently? Yes No

60- Have you ever been hoarse for more than a month? Yes No

D

61- Do you need glasses for any reason? Yes No

62- Do your eyes usually blink or water? Yes No

63- Are your eyes often red or inflamed? Yes No

64- Do you often see spots before your eyes? Yes No

65- Do you ever have severe pains in or behind your eyes? Yes No

66- Has your eyesight ever blacked out completely? Yes No

67- Do you ever see things double? Yes No

E

68- Are you hard of hearing? Yes No

69- Have you had frequent severe earaches? Yes No

70- Do you suffer from other trouble? Yes No

71- Have you ever had a running ear? Yes No

72- Do you hear constant hissing in your ears? Yes No

it is felt that it is best to have the patient answer sections A and B before the oral examination and the remainder of the questions after some rapport has been established by personal contact with the dentist at the first session.

EVALUATION

The answers to the questionnaire should be reviewed by the dentist in the patient's presence so that necessary supplementary information can be obtained for all affirmative replies. Several affirmative responses to a particular group of questions indicate a strong probability of disease and the need for medical consultation and study. The patient's response to various life situations will aid the dentist in judging the emotional background for medical referral or for determining the manner of approach in dental therapy.

The New York University Dental-Medical Questionnaire and its predecessors have been in use in the clinic of the department of periodontia by the students as well as in the private practices of the authors for several years, and the results in both situations have been valuable and helpful. No instances were encountered in which patients objected to revealing the information required.

9. D'Onofrio, J. J. The dental application of the New York University health survey chart. Unpublished term paper.

10. Koteen, S. M. Dental application of the Cornell medical index. Unpublished term paper.

A series of 87 unselected histories were re-examined by postgraduate periodontics students[9, 10] for an impartial evaluation of the questionnaire. During the previous routine examination each patient had been interviewed by an undergraduate student to obtain the history and to make an analysis of the patient's periodontal condition. These histories, obtained by verbal interview alone, had been recorded and summarized on the periodontics record chart.[7] The histories of the same patients were re-evaluated by the use of the New York University Dental-Medical Questionnaire with a verbal review of only the affirmative responses.

Preliminary appraisal of the observations determined in the 87 cases by the two methods was made by both the undergraduate and the postgraduate students with the results summarized as follows:

1. The New York University Dental-Medical Questionnaire was equal to the verbal interview in accuracy and completeness in 33 cases.

2. The New York University Dental-Medical Questionnaire was of a greater accuracy and completeness than the verbal interview in 50 cases.

3. The New York University Dental-Medical Questionnaire was of less accuracy than the verbal interview in 4 cases.

SUMMARY

A need exists for a practical method of taking a patient's comprehensive dental and medical history to aid in arriving at a carefully planned diagnosis. This study can be of great benefit to the patient and of considerable help to the dentist in planning and executing treatment.

The New York University Dental-Medical Questionnaire is a means of obtaining, with a minimum of time expenditure by both the examining dentist and the patient, a comprehensive dental and medical history and also an adequate and accurate revelation of the patient's symptoms and complaints; it can be obtained without the supervision of the dentist. The questionnaire is not a substitute for the personal interview but will help to initiate quickly and accurately a thorough survey of abnormalities. The questionnaire must be followed by verbal interrogation to ascertain the significance of the responses. The divisions of the questionnaire facilitate the patient's responses and their interpretation by the practitioner.

The accuracy of the New York University Dental-Medical Questionnaire was tested in 87 cases; and compared with the verbal interview, it proved of equal accuracy in 33 cases and of greater accuracy in 50 cases; it was less accurate in 4 cases.

Modern Medicine • The profession of medicine has progressed from study of the diseased organ to consideration of the total personality of the patient and is now ready for the concept of the individual as a member of a family in the community setting. Conversely, professions such as public health nursing, which think of the family unit as naturally as a doctor thinks of a patient, have proceeded in reverse, from the family in the community to the individual personality, to the diseased organ and medical treatment. The time is ripe for a coordinated attack on the problems of family adjustment in relation to maintenance of health and the treatment of illness. *H. B. Richardson, Patients Have Families, 1945.*

COUNCIL ON DENTAL TRADE AND LABORATORY RELATIONS

American Dental Association position in relation to constituent society programs for accrediting or certifying dental laboratories

The Council wishes to impress on the chairmen of constituent society committees responsible for profession-craft matters that the American Dental Association may not under present policies participate actively in the formulation of accreditation programs for dental laboratories although the advice and guidance of the Association's Council on Dental Trade and Laboratory Relations will be available to such constituent society committees. The American Dental Association also may not involve itself in any way in the administration of such programs. Within the provisions of a few of the plans now in effect at the constituent society level there is language which erroneously indicates that the American Dental Association has some administrative authority; for example, the right of a dental laboratory to appeal to the Association from a denial of accreditation or from a rescission of its accredited status is stated in one of the plans.

In 1949 the Association's House of Delegates authorized the Council on Dental Trade and Laboratory Relations to revise the accreditation plan to give the constituent societies full responsibility for policies and administration of their accreditation programs under the guidance and advice of the American Dental Association. In 1950 the House of Delegates approved the revised plan for accreditation of dental laboratories presented by the Council. The plan sets out principles and guides for formulating an acceptable program. No part of the Association's revised plan suggests that the American Dental Association will participate in the administration of constituent society programs.

REQUIREMENTS FOR AND BENEFITS OF ACCREDITATION

As originally conceived, the plan for accrediting or certifying dental laboratories which satisfactorily fulfilled all requirements of the plan was directed entirely toward establishing the highest possible standards of workmanship, efficiency, and business conduct for commercial dental laboratories, which, if adhered to, would be reflected in improved and more efficient dental health services for the dentists' patients. The principal incentive impelling a dental laboratory to seek accredited status, therefore, was recognition of the certificate and seal of accreditation by members of the dental profession as assurance that the accredited dental laboratory was unreservedly qualified to provide to dentists the types of services for which the dental laboratory was equipped. To give substance to that

incentive, members of the profession were to be educated to recognize the significance of the accredited status achieved by a dental laboratory and the advantages to be gained from patronizing accredited laboratories.

The plan as originally conceived was essentially voluntary. Any dental laboratory which could meet the standards required for accreditation could qualify for accreditation; dentists, on the other hand, could freely choose to patronize nonaccredited laboratories. No economic advantage was offered to accredited dental laboratories other than that which could be derived from a recognition of their preferred standing within the dental laboratory industry. There were no direct or indirect sanctions suggested to be imposed against dental laboratories which did not seek accreditation or who were refused accreditation. The philosophy of dental laboratory accreditation or certification expressed in the Association's original plan still underlies the principles and guides contained within the Association's revised plan.

CONSTITUENT SOCIETY ACCREDITATION PROGRAMS

In evaluating the constituent society accreditation programs recently reported to the Council as currently in effect, the Council has noted some degree of deviation from the philosophy of the original and of the revised plans of the Association. There are, perhaps, legitimate reasons for limiting eligibility for accreditation or certification to members of the state laboratory association. But the constituent society which includes or contemplates including that restriction in its accreditation program should recognize its effects; namely, (1) that an agency outside the dental society does or will establish the primary basis for eligibility for accreditation; (2) that there may be dental laboratories within the state fully deserving of accredited status which do not choose to be members of the laboratory association; and (3) that the accreditation program serves at least as an economic stimulant to dental laboratories to join the laboratory association and is practically an economic compulsion to such membership where the constituent society denies advertising in its official publication to nonaccredited dental laboratories.

Again, there may be legitimate reasons for desiring to restrict advertising in the dental society's official publication to accredited laboratories. But before adopting such restrictions the constituent society concerned should also explore their effects; namely, (1) the dentist, instead of being educated and encouraged to use the services of accredited laboratories, is to some extent being confined to dealing with accredited laboratories; (2) where membership in the dental laboratory association is a condition of eligibility for accreditation, the advertising restrictions will practically compel the dentist to deal with members of the state laboratory association; and (3) laboratory association membership as a condition for eligibility for accreditation coupled with the restricting of advertising space to accredited laboratories practically compels all dental laboratories within the state to join the state laboratory association.

Finally, any plan for awarding direct economic advantages to accredited dental laboratories should be checked carefully from a legal viewpoint before it is put into effect. Such a plan may meet with no legal obstacles in one state but may in another. Constituent societies are well advised in any event to submit proposed accreditation plans or any revisions of existing plans to their legal counsel for his opinion on their possible legal effects.

Dental laboratories are engaged in business and trade; their associations are trade associations. There are trade laws and regulations at both federal and state levels which govern the activities of den-

tal laboratories and their trade associations. The application or lack of application of those laws and regulations to any accreditation plan requirement or benefit under consideration should be determined before that requirement or benefit is incorporated within the constituent society's program.

COUNCIL ON DENTAL HEALTH

Dental services under welfare health programs

Largely because of improved public and individual health measures, the life expectancy of persons living in the United States is increasing to the point where the average person may now expect to live to the age of 67 years. This phenomenon of living longer poses some grave problems in subsistence and in health services since dependency and morbidity also seem to increase directly with age. For the past several years, dentists have voiced increasing concern over the magnitude and the standards of the health programs which are administered by governmental agencies. Because of this growing concern, the Council on Dental Health has devoted a study to one of the larger aspects of this problem which involves the participation of dentists in programs of care for recipients of public assistance.

If, in the early future, country-wide dental services should reach a volume that approximates the amount of Pennsylvania's 1946 public assistance, of which 11 per cent was for dental services,[1] and if the Division of Public Health Methods of the Public Health Service has estimated accurately the total expenditures for all public assistance health services, then dentists may expect to be involved at an early date in an expenditure by government of approximately $30,000,000 per annum[2] (roughly $400 per dentist). Also, dentists may anticipate that the public assistance demand for their services will expand steadily because of the increasing size of the old-age group.

In order to develop guiding principles for the provision of dental services under community welfare programs, the Council on Dental Health reviewed the pertinent existing policies of the American Dental Association, the American Public Welfare Association, the American Public Health Association, the Association of State and Territorial Health Officers, the Social Security Administration of the federal Department of Health, Education and Welfare, and the American Medical Association. In addition, the Council surveyed practices and attitudes of state health department officials regarding provision of dental services under welfare programs. A summary of the information obtained from these sources is presented in the following paragraphs.

POLICIES OF OTHER ORGANIZATIONS

American Public Welfare Association • The American Public Welfare Association states that, "Public welfare is that area of

1. Pennsylvania Department of Public Assistance. Pennsylvania's program of medical care for public assistance recipients. Harrisburg, Pa., 1947 (processed).

2. Mushkin, Selma J. Medical services and the Social Security Act amendments of 1950. Public Health Rep. 66:98 Jan. 26, 1951.

governmental service which protects individuals and families against potential or actual social disaster, including economic want, and helps them find the means to regain economic and social self-sufficiency."[3]

A review of statements made by this association[3,4] indicates that it approves (1) active advocacy of measures which prevent need and promote individual and social welfare; (2) governmental social insurance to assure maintenance of income for individuals and their families during periods when work is impossible or unavailable for them; (3) the provision of health services through governmental and voluntary agencies when needy individuals cannot assure such services for themselves; (4) the geographical equalization of the costs of public assistance by the federal government and the federal development of nation-wide goals and standards; (5) administration by a single agency at each level of government with considerable flexibility in administration of local plans; (6) the provision for appeal from administrative decisions by recipients of public assistance; (7) the exclusion of arbitrary restrictions based on age, sex, race, creed, residence, citizenship or the cause of a situation of genuine need; (8) the utilization of a local means test to determine eligibility for public assistance, and (9) the maintenance of the confidentiality of the records of recipients of public assistance.

American Public Health Association • Excellent source material on the attitudes of the American Public Health Association and the American Public Welfare Association has been published.[3,4] Particularly pertinent statements are excerpted in this report. A statement of the Joint Committee on Medical Care of these two associations[4] reiterates the responsibility of government to assure the availability of health care to those unable to purchase or otherwise obtain it for themselves. The statement lists five factors that account for variations in eligibility requirements for medical care for the needy in different communities: (1) the terms of the legislation under which the program operates; (2) the availability and adequacy of the funds provided by federal, state and local sources to finance the service; (3) the attitude of the community; (4) the administrative practices of the agency determining eligibility, and (5) the availability of health care facilities.

The Joint Committee recognized that the administration of programs of medical care for the needy is a joint responsibility of departments of public health and public welfare:

> Medical care is obviously one of the basic requirements of a needy family and, hence, a welfare concern. Public health, primarily concerned with prevention, has found the problems of prevention and treatment increasingly interrelated, and has therefore become concerned with the availability of medical care.

The statement points out that direct responsibility for providing general health care for the needy may be vested in either a health or welfare department and that, in either instance, sound administration requires that health care programs should be directed by persons who have technical knowledge in this field.

Social Security Administration of the Federal Department of Health, Education and Welfare • The administration of federal welfare funds and the effects of the 1950 Amendments to the Social Security Act were described by Mushkin:[2]

> The Social Security Act Amendments of 1950 pave the way for considerable extension and expansion of medical care for the needy. These amendments . . . make three major changes in the public assistance recipients.

3. American Public Welfare Association. Essentials of public welfare. Public Welfare 11:3 Jan. 1953.

4. Joint Committee on Medical Care of the American Public Health Association and the American Public Welfare Association. Tax-supported medical care for the needy. Am. J. Pub. Health 42:1310 Oct. 1952; also Public Welfare 10:87 Oct. 1952.

(1) Federal grants may now be made to States with approved plans for assistance to the permanently and totally disabled, thus setting up a new categorical public assistance program. (2) Federal grants are authorized for direct payments for medical services to persons or institutions furnished medical or remedial care to the needy who are aged, blind, permanently and totally disabled, or dependent children. (3) Federal aid is made available to finance payments to the aged, blind, or permanently and totally disabled recipients of public assistance who are patients in public medical institutions, other than institutions for mental diseases and tuberculosis.

Association of State and Territorial Health Officers • At a meeting in December 1952, the Association of State and Territorial Health Officers adopted the following statement[5] in response to a request of the Council on Dental Health of the American Dental Association for an expression of the attitude of the former organization on the administration of health care programs for recipients of public assistance:

I. Objectives to be achieved

Insofar as is possible within the limits of available knowledge, personnel and facilities, the objective of a dental care program for recipients of public welfare is to improve dental health and eliminate dental disease as a contributing factor to dependency through a program of prevention, education, treatment and rehabilitation.

II. Program content

A dental care program for the recipients of public welfare should provide:

Where funds, personnel and treatment facilities are insufficient for complete dental health care for all eligible persons, priority should be given to the relief of pain and the treatment of infections for all groups.

In order to prevent a high incidence of total loss in adult life, early and continued dental care for the younger age groups is of primary importance. Treatment programs, therefore, should provide for complete dental care for the younger age groups with older age groups being added as rapidly as resources will permit.

III. Administration

1. Administration of a dental care program for welfare recipients should be the responsibility of an official governmental agency.

2. Standards of care should be established through consultation with professional advisory committees.

3. Supervision and direction of the program should be provided by competent professional personnel.

4. The administration of such dental care should remain close to the recipient and to the dentist providing the care.

5. Public health departments most nearly meet the previously mentioned criteria.

To retard the current and the expanding accumulation of relief costs resulting from ill health, community preventive and educational measures must receive primary emphasis.

State Health Departments • Late in 1952, the dental health directors of 33 state health departments replied to questionnaires regarding (1) whether their departments conduct programs of dental care for dentally indigent children; (2) the agencies administering dental welfare programs in their states, and (3) their attitudes relative to administration of dental welfare programs by state health departments.[6]

In the majority of the 33 states reporting, both the health departments and the welfare departments were providing some direct services for dentally indigent children. A few state health departments were handling the administration of programs through which actual services were being provided by other agencies, and a few other state health departments were offering consultation services only or furnishing financial aid to local programs. In five states, the state health departments were also administering dental care programs for the welfare departments. As might be expected, the attitude of the dental health director as to which was the suitable agency to administer the dental welfare programs depended on the *status quo*.

5. Transactions, The Association of State and Territorial Health Officers, Washington, D. C., December 10, 1952.

6. American Dental Association, Council on Dental Health, Dental care programs for indigent children and administration of dental welfare programs, J.A.D.A. 46:554 May 1953.

American Medical Association • The American Medical Association is considering the adoption of "Ten Guides for Medical Care Programs."[7] To serve its purpose best, according to the proposal, a medical care plan for the indigent should (1) provide all necessary services normally available locally to others; (2) make equal services and facilities available to all indigent groups; (3) utilize existing facilities and avoid duplication wherever possible; (4) wherever feasible, offer free choice of physician in home and office care; (5) develop and use free out-patient clinics not affiliated with teaching hospitals and medical schools only when mutually agreeable to the medical profession and the administrative agency involved; (6) provide for medical supervision of all medical aspects; (7) provide reasonable payment to physicians on a basis agreed to by the medical society; (8) provide for local administration by a single agency; (9) provide for continuous liaison between the medical society and the administering agency, and (10) give additional consideration to special diagnostic aids, preventive medical services, health education, rehabilitation, and home nursing as a substitute for prolonged hospital care.

POLICIES OF THE AMERICAN DENTAL ASSOCIATION

The preceding review has led the Council on Dental Health to cite the pertinency of statements previously adopted by the American Dental Association and to make additional recommendations relating to the provision of dental care for recipients of public assistance.[8] These reaffirmations and new policies adopted at the Association's 1953 annual session are assembled here as a documented source for future reference.

Objectives • The Council on Dental Health concurs, in general, with the concepts expressed by the Joint Committee on Medical Care of the American Public Health Association and the American Public Welfare Association[4] to the effect that medical care for the needy makes possible reduction of dependency and the achievement of a healthier status for the marginal economic group of people in the United States. However, the Council wishes to emphasize the difference between public health and public welfare concepts.

Public welfare is essentially a service program and is primarily concerned with meeting an emergency for certain individuals created by the lack of funds to provide essential living requirements. (One of the unfortunate results of a poorly administered public welfare program is a tendency to foster continuing dependency by creating an attitude among public welfare recipients that society "owes them a living.") Public health, on the other hand, is concerned with the promotion of optimum health and the prevention of disease among all segments of the population. The aim of public health is to keep people well. Public health departments, because their administrators and other specialists are trained in clinical health services, are increasingly expected to participate in planning and administering health care programs and facilities for the care of the chronically ill, the aged and the indigent.

Constitutional Obligations of the Federal Government • The provision of dental care in community programs should be based on the principle that "dental health is the responsibility of the individual, the family, and the community, in that order. . . . The community in all cases should

7. American Medical Association Council on Medical Services: J.A.M.A. 150:933 Nov. 1, 1952. (Revised and mimeographed by the Council on Medical Service, June 6, 1953. Final action deferred until Dec. 1953 meeting of the A.M.A. House of Delegates.)

8. American Dental Association, Council on Dental Health, Proceedings, April 1953.

determine the methods for providing services in its area."[9] Federal aid may be provided through state and local governments to make health services available to needy persons whose eligibility for such services is determined at the local level.

An examination of the Constitution of the United States and of several legal opinions regarding its interpretation[10] leads the Council to reject the presumption that has grown in acceptance by some groups during the last 20 years to the effect that health care is a basic constitutional obligation of the federal government, secured for individuals as a positive right through Article I Section 8 (Powers of Congress).

Administration by Local Departments of Public Health • Any provision to finance health care for recipients of public assistance should permit public health departments to administer the treatment involved.[11]

Experience and observation prove that all health programs, however limited, should be directed by persons who have technical knowledge of health care, and all professional service should be under the immediate supervision of qualified members of the profession concerned.[12]

Confidentiality of Reports • Information involving health services, diagnostic information or data by which diagnosis is made or treatment provided for recipients of public assistance, which may be contained in social case records and public assistance records, should be maintained in confidential or privileged status in order that the rights of the patient be protected and the full cooperation of the health professions assured.[13]

It is basic to the code of ethics of the health professions that information regarding the health of a patient and obtained in a professional relationship must be treated as privileged and maintained in confidential status.

This code of ethics applies to all individuals regardless of whether they pay for their own care, are treated under public or voluntary auspices, or receive health care or examination as a part of a public assistance program. A large number of social case records of public welfare agencies contains medical records and information necessary to the establishment of eligibility for assistance or medical services.

Payments for Health Services • The agency administering the public assistance program should be authorized to purchase health care in behalf of recipients of assistance, and the financing should be accomplished through the use of funds earmarked for that purpose rather than charged against the funds available for cash payments to individuals.[11]

Payments to dentists participating in the program may be made on a full-time, part-time, hourly or unit-of-service basis. The payments to participating dentists should be determined by authorized representatives of the dentists who rendered the dental services. In all cases, payments should be consistent with the provision of a high-grade dental service.[14]

Federal legislation permits payment of fees directly to the dentist.

Priorities of Treatment Services • Although priorities in treatment service usually are listed separately for children

9. American Dental Association. Transactions, 1944, p. 376.

10. Walker, T. F. The joker in the Constitution: a basis for the Welfare State. Am. Bar. A. J. 38:475 June 1952.

11. Inter-Association Committee on Health. Joint statement in regard to medical care for the needy. Amended and approved, March 28, 1950. 1 p. (processed). Approved by American Dental Association. Transactions, 1950 (p. 240M).

12. Sturge, Gertrude. Public medical service as it is today at state and local levels. Social Service Rev. 14:501 Sept. 1940.

13. Inter-Association Committee on Health. Confidentiality of public welfare records. (Released for publication Feb. 1, 1952.) Approved by the American Dental Association. Transactions 1951, p. 193.

14. American Dental Association. Transactions, 1949, p. 264.

and adults, certain services, such as the relief of pain and the treatment of acute infection, should be available to all regardless of age classification. The following priority classification of treatment services is recommended:[14]

For children:

1. Relief of pain and treatment of acute infections.
2. Elimination of pathosis and extraction of unsavable teeth.
3. Treatment of permanent teeth with exposed vital pulps.
4. Treatment of bone and soft tissue diseases and anomalies.
5. Repair of injured or carious permanent teeth.
6. Repair of injured or carious primary teeth.
7. Prosthodontic and orthodontic services.

For adults:

1. Relief of pain and treatment of acute infections.
2. Elimination of pathosis and extraction of unsavable teeth.
3. Removal of irritating conditions which may lead to malignancies.
4. Treatment of bone and soft tissue diseases.
5. Repair of injured or carious teeth.
6. Replacement of lost teeth and restoration of function.

Facilities for Rendering Services • Every effort should be made to use to the maximum extent existing facilities for rendering dental health services. Such facilities should include the offices of private practitioners, hospital dental clinics, mobile dental units and other private and public facilities.[14]

The factors which influence the choice of treatment services are:[15]

1. Availability of established clinics.
2. Availability of dentists who are interested in children's dentistry.
3. Ratio of dentists to the general population.
4. Comparative costs of service rendered in a clinic or by a practitioner.
5. Transportation facilities for patients.
6. Costs of establishing and maintaining new clinics.
7. Administrative problems associated with clinic or private office.

Means Tests • Public assistance, in order to maintain its residual character and not become competitive either with other social measures or the labor market, must be granted on an individual basis with full knowledge of individual and family needs and resources actually available to meet those needs. The standards on which these determinations are based should be objective, consistent and understandable to the recipient and to the public alike. Moreover, specific decisions should be subject to objective review on appeal of the recipient.[8, 16]

The determination of those eligible to receive dental care at the expense of the public always should be made locally, should be based on a plan acceptable to the concerned groups of the local community, and should be related to ability to pay.[14]

Advisory Boards • An advisory group should be established to cooperate with the local dental group in order to ensure the development and maintenance of high standards of dental care.[17] The local dental society should be consulted to obtain advice on technical and professional matters. A dental advisory board should cooperate with and counsel the administrative authority concerning:

1. Most practical method of providing needed dental services.
2. Priority of dental service.
3. Dental fees or salaries.
4. Qualifications of dentists for participation.
5. Evaluation of dental program.

15. American Dental Association. A dental care plan for low income groups. Chicago, American Dental Association, 1946, p. 6.

16. American Public Welfare Association, Committee on Welfare Policy. Statement of public welfare principles. Preliminary draft. Washington 1950 (processed).

17. American Dental Association. Transactions, 1953.

6. Liaison between dental society and administrative authority.

Preventive Services • Such preventive measures for the control of dental disease as are approved by recognized dental authorities should be included in community dental health plans.[17]

Financing • Local funds should be utilized, whenever possible, for the initiation and maintenance of dental welfare programs.[14] How to influence budgetary bodies to provide tax funds is a difficult problem but certainly not the primary responsibility of the dental profession. However, members of organized dentistry can serve as a very potent group in creating public interest in the need for community financing of public welfare programs.

Inclusion of Dental Welfare Benefits Under Blue Shield and Blue Cross Programs • Welfare recipients should be insured in Blue Shield and Blue Cross programs to the extent that the various state programs include dental benefits.[17]

SUMMARY

In order to assist dental societies in cooperating with agencies responsible for the inauguration and maintenance of sound dental health programs for recipients of public assistance, the foregoing expressions of policy are summarized in the following statement adopted by the House of Delegates of the American Dental Association in 1953:[17]

1. Public welfare services are distinguished from public health services in that—
   a. public welfare services are primarily concerned with meeting emergencies created by the lack of funds to provide essential living requirements;
   b. public health services are directed toward attempts to help people help themselves and are concerned with the promotion of optimum health and the prevention of disease among all segments of the population.

2. The responsibility for providing dental care should rest with the individual, the family, and the community, in that order. The community, in all cases, should determine the methods for providing welfare dental services in its area.

3. The welfare health program should be directed by persons who have technical knowledge of health care. The dental phase of the program should be under the immediate supervision of a qualified dentist.

4. Public assistance should be granted on an individual basis with full knowledge of individual and family needs and resources.

The determination of those eligible to receive dental care at the expense of the public should be made under a plan acceptable to the local groups concerned and should be related to ability to pay.

Information regarding the diagnosis and treatment provided for welfare patients should be maintained in confidential status in order that the rights of the patient be protected.

5. Whenever possible, local funds should be utilized for the initiation and maintenance of dental welfare programs. The facilities of voluntary prepayment health care plans may be used by the community to finance welfare dental care to the extent that such plans include dental benefits.

6. If funds and other facilities are not available to provide all necessary dental treatment for welfare clients, priority should be given in accordance with the classifications recommended in the Association's *A Dental Health Program for the Community, State and Nation.*

7. In order to retard the current and expanding accumulation of relief costs resulting from ill health, disease prevention and education measures on a community basis should receive primary emphasis.

8. Payments to participating dentists should be determined by authorized representatives of the dentists who will render the dental services. In all cases, payments should be consistent with the provision of a high grade of dental service.

9. The local welfare agency should seek the advice of official representatives of the dental profession on technical and professional matters related to dental care to assure a high standard of dental treatment and to assist in the maintenance of these standards.

10. Wherever feasible, the welfare patient should be given the opportunity to select a dentist of his own choice.

JUDICIAL COUNCIL

Ethics

The Judicial Council of the American Dental Association is required to render many opinions and decisions each year. Some of these opinions afford interesting reading as well as guides to reasonable conduct. In publishing them, all parts are deleted that would identify the inquirers or those whose names may be associated with the controversy. The questions raised in the following inquiries are covered by the *Principles of Ethics* of the American Dental Association, copies of which may be secured by writing to the Central Office of the Association.

LISTING OF DENTISTS IN TELEPHONE DIRECTORY

Question • Kindly send me any available information which you may have governing the listing of dentists in the classified section of telephone directories.

As a member of the Board of Governors of our state dental association, I have been assigned the task of making our state telephone directories uniform in dentist listing, since there have been many complaints of unethical listings such as "certified denture specialist," etc.

I am familiar with the *Principles of Ethics* of the American Dental Association. The section on directories is not specific as to what constitutes a violation. Perhaps there may be additional information you can send me, such as the accepted telephone listing followed by other state and local associations.

D.D.S., Connecticut

Reply • The Judicial Council is in receipt of your letter on behalf of your state dental association regarding the listing of dentists' names in telephone directories.

The Association has no rules or regulations regarding this question other than those listed in the *Principles of Ethics*, Section 19. You will note from a study of the last two lines of this section that it is rather broad in its scope and leaves this matter largely to the good judgment of the local or state society.

For instance, some dental societies prefer to list their specialists under their respective specialties, that is, pedodontist, periodontist, orthodontist, and so on. The dentist's name should appear in only one listing. Unless the dentist is a bona fide specialist and so recognized by the local dental society and confines his practice to said specialty, he should not list himself as a specialist. Many state dental societies have very specific regulations as to the accepted way in which a dentist can ethically list himself in a telephone or any similar type directory.

May we suggest you contact the secretaries of several state dental societies, say in Florida, North Carolina and Michigan.

Chairman, Judicial Council

ANNOUNCEMENT OF DISCONTINUANCE OF PRACTICE

Question • I am about to discontinue my practice of dentistry in this town and would appreciate knowing what would be the accepted procedure of announcing my decision.

How much time should I give my patients in order that they may see me regarding any dental problems they may have?

Also what kind of wording should be used in a newspaper announcing the closing of a dental practice?

Any other information that you would

give me in this regard would be appreciated.

D.D.S., Minnesota

Reply • In reply to your first question, "How much time should I give my patients in order that they may see me regarding any dental problems they have," unless you are in a hurry to leave town or move to a new community, probably two or three months would give you ample time to complete work in process or take care of those older and valued patients who might want to come in for a final checkup.

In regard to your next question, "What kind of wording should be used in a newspaper announcing the closing of a dental practice," it would appear that a formal announcement in the local paper—say for three or four issues—would be both sufficient and ethical. Some wording such as this would do:

> Dr. John Doe
> City, State
>
> Wishes to announce to his former patients that he is giving up his practice of dentistry at city, state, on October 30, 1953.

No other explanation need be made unless you feel it necessary. Certainly you could not be accused of trying to get new patients during this period as your announcement is to your former patients. It goes without saying that you should not accept any new patients during this period except in an emergency.

If you want to forego the notice in the newspaper, the best and surest way to let your patients know you are giving up practice is to have a notice printed on a nice 3 by 5 card, placed in a suitable envelope and mailed to all your patients on record. This procedure would be the most ethical and thoughtful method of notifying your former patients of your decision.

We note yours is a town of between 1,000 and 1,200 people. Probably, like most dentists who have practiced several years, you have the names of many patients in your records who have not been to you for two or more years. Notices need not be sent them. We are enclosing a copy of the *Principles of Ethics* and refer you to Section 15 on "Announcements."

Chairman, Judicial Council

COUNCIL ON DENTAL RESEARCH

List of certified dental materials

Since the publication of the most recently revised List of Certified Dental Materials (revised to September 1952) in the November 1952 issue of THE JOURNAL, the following materials which conform to the American Dental Association specifications have been added.

CERTIFIED AMALGAM ALLOYS
(A.D.A. SPECIFICATION NO. 1)

Alloy	*Manufacturer or distributor*
20th Century, Non-zinc Tri-Alloy	The L. D. Caulk Co. Tri-Boro Dental Supply Co., Inc.

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Survey of needs for dental care
VI. Summary and comparison with 1940 survey

The main purpose of this survey was to obtain national statistics on needs for dental care according to age, sex, length of time since last visit to a dentist, region, income and occupation.[1] As a by-product, it also furnished information on how various groups compare in frequency of attendance at the dentist.

Ideally, the sample in a study of needs for dental care should consist of a cross section of the general population. Since it has not been possible to make such a survey on a nation-wide basis, the most practical alternative, a survey of dental patients, was conducted.

It is probable that the dental needs of certain categories of patients included in the survey come closer to describing the dental needs of the "man on the street" than do the total needs figures. Inasmuch as median spending-unit income in the United States is approximately $3,400, the dental needs figures for the $3,000 to $3,999 income bracket might be used to describe the dental needs of the general population. Inasmuch as the length of time since the average adult in the general population last saw the dentist apparently is in the vicinity of two years, the dental needs figures for the 1½ to 2 years "length of time" group might be considered in describing the dental needs of the general population. It should always be borne in mind, however, that these groups exclude people who fail to visit the dentist.

Dental needs varied more with age than with any of the other variables considered in this study. This fact, however, is probably axiomatic among all who have made any study of dental needs. Next to age, variation in dental needs was greatest according to length of time since last visit to a dentist. This factor showed a considerably closer relationship to dental needs than did the income of the patient. The factor with which dental needs varied least was the region of the country, although it was possible to discern some definite patterns of need by region.

In this, as in previous surveys, females of all ages have been shown to be more diligent in the care of the teeth than males. The proportion of the female population included in the sample was greater than that of the male population in every age bracket except 70 to 74. This lone exception could have resulted from sampling error. In the age group 20 to 24, the proportion of the female population included in the survey was well over twice the proportion of the male population. For every 10 males included in the survey, there were 14 females.

The proportion of the nation's professional and semiprofessional workers represented in the survey sample was approximately five times as great as the proportion of farmers, service workers and laborers.

For decades the existence of a tremendous amount of unmet dental needs has been a matter of common knowledge. To the student of dental needs, this question often occurs: "Are unmet dental needs greater or less now than in former years?"

The present survey, together with a similar survey conducted by the Associa-

1. The five previous articles of this series appeared in "Reports of Councils and Bureaus" in the following issues of The Journal: December 1952; February, May, August and September 1953.

Table 25 • Average number of fillings required according to 1940 and 1952 surveys of dental needs, by age and sex

Age	Males		Females	
	1940	1952	1940	1952
15-19	7.0	6.0	6.5	5.4
20-24	6.5	4.4	6.5	4.6
25-29	5.7	3.8	5.4	4.0
30-34	5.4	3.3	4.4	3.3
35-39	3.7	2.6	4.0	2.7
40-44	3.6	2.2	3.2	2.3
45-49	2.7	1.7	2.8	1.9
50-54	2.1	1.4	2.3	1.7
55-59	1.8	1.0	1.9	1.2
60-64	1.1	.8	1.1	1.1
65-—	1.6	.7	1.1	.9
Total	4.3	2.9	4.4	3.1

tion in 1940, presents evidence on this question, with respect to the dental needs of adults. In the 1940 survey, entitled "A Study of the Dental Needs of Adults in the United States," the sample consisted of 7,541 dental patients 15 years of age and older, selected in such a manner as to provide a representative sample of all dental patients of this age group.

As indicated in Table 25, the number of fillings required among patients 15 and older was considerably less in 1952 than 12 years earlier for both men and women of practically all age groups. It is clear from this Table that the average adult patient in 1952 had fewer unfilled cavities than the average adult patient in 1940.

Table 26 shows that in general, fewer teeth required extraction in 1952 than in 1940. This was true of males except for the two lowest age groups and of females except for the three lowest age groups. Females required substantially fewer extractions than males both in 1940 and in 1952.

The over-all percentage of patients requiring complete dentures in 1952 does not appear to differ significantly from the 1940 figure (Table 27). Inspection of the figures for specific age groups, however, reveals a definite pattern. For both male and female patients, the need for both upper and lower dentures was greater among 1952 patients from age 15 to 34 (to 39 in the case of women patients needing lower dentures); in all higher age brackets the need was greater in 1940. When the economic conditions that prevailed prior to 1940 are considered, the greater need for complete dentures among patients 35 and over at that time seems understandable. It is harder to explain why the same relationship does not hold for patients under 35.

It is not possible to determine from these two surveys whether the incidence (rate of occurrence of a given period of time) of dental disease was greater or less in 1952 than in 1940. It is true that dental patients in 1952 required fewer fillings and fewer extractions than did dental patients 12 years earlier. The surveys indicated, however, that people were seeing the dentist more frequently in 1952 than in 1940. The questions on length of time since last visit to a dentist were framed differently in the two surveys, preventing an exact comparison. Also, in the 1940 survey, the part of the analysis that dealt with dental need according to length of time since last visit to a dentist excluded patients who had seen the dentist within the previous three months. With this exclusion, the average length of time since last visit to a dentist

Table 26 • Average number of extractions required according to 1940 and 1952 surveys of dental needs, by age and sex

Age	Males		Females	
	1940	1952	1940	1952
15-19	1.0	1.1	.8	.9
20-24	1.3	1.4	1.3	1.3
25-29	2.6	1.5	1.4	1.4
30-34	1.9	1.6	1.9	1.5
35-39	2.6	2.0	2.1	1.6
40-44	3.2	2.3	2.5	1.6
45-49	4.8	2.4	3.1	2.2
50-54	4.2	2.5	2.9	1.8
55-59	4.7	3.0	3.1	2.1
60-64	4.1	3.2	3.2	2.1
65-—	3.5	2.7	2.9	2.0
Total	2.7	2.0	2.0	1.6

Table 27 • Percentage of patients requiring complete dentures according to 1940 and 1952 surveys of dental needs, by age and sex

Age	Males				Females			
	Complete upper		Complete lower		Complete upper		Complete lower	
	1940	1952	1940	1952	1940	1952	1940	1952
15-19	1.6	2.0	.6	1.1	1.0	2.4	.5	1.0
20-24	1.8	4.3	.7	2.6	1.8	3.5	.7	2.0
25-29	3.0	4.7	2.1	2.9	3.9	5.6	2.4	3.3
30-34	5.4	8.8	1.2	6.4	6.3	7.6	4.3	4.4
35-39	15.3	12.8	10.0	9.2	10.1	9.6	4.2	6.5
40-44	18.3	17.4	14.3	13.9	20.1	12.3	12.5	8.2
45-49	25.5	18.4	17.4	14.0	26.2	17.6	19.2	13.8
50-54	36.3	23.8	25.6	18.7	33.1	19.9	23.2	15.2
55-59	40.6	32.4	27.1	26.6	35.0	23.5	22.5	20.7
60-64	40.4	32.7	37.2	29.3	45.2	26.9	30.6	21.3
65-—	38.1	34.1	30.5	29.3	42.4	31.4	25.9	27.8
Total	14.9	14.3	10.2	11.3	12.9	11.0	8.1	8.2

was 2.5 years for males and 2.2 years for females. In the 1952 survey, after eliminating the estimated number who had seen the dentist within three months and patients under 15 years of age, the average length of time since last visit to a dentist was 1.9 years for males and 1.6 years for females. It appears that this difference might account for the difference in prevalence of dental needs in 1940 and 1952.

The two outstanding facts emerging from this comparison of the two surveys are (1) prevailing dental needs were generally less in 1952 than in 1940 and (2) 1952 dental patients saw their dentist more frequently than did 1940 patients. These facts, together with the close correlation shown in the Survey of Needs for Dental Care between amount of unmet dental needs and length of time since last visit to a dentist, point once again to the rewards accruing to those receiving timely dental care and to unhappy consequences of dental neglect.

B. Duane Moen, Director

Family dental survey
I. Dental health concepts

What do the people really believe regarding the care of the teeth? How often do people of different age and income levels see the dentist? When people neglect to see the dentist, what are the main reasons? How many people wear dentures and what is their age distribution?

To obtain the answers to these and many other questions that can be answered only by the people themselves, a mail survey was conducted in mid-1953. Information was collected from 2,443 "spending units" consisting of families and single adults, including a total of 8,320 individuals. (In this study, these 2,443 spending units will be referred to as families, inasmuch as families comprise the great majority.) These families, who are members of a panel maintained by a survey company, are a cross section of the general population of the United States. Panel members correspond closely with the general population with respect to such factors as age, income, geographic region, and population density.

Questionnaires in this survey were in most cases filled out by housewives. Replies to most questions, particularly those dealing with opinion, were made by the housewife in her own behalf. In other questions, factual information has been supplied by the housewife on all members of the family. Where information in this study pertains to all family members, this fact will be pointed out.

The Family Dental Survey questionnaire was sent to 3,000 families, of whom 81.4 per cent responded. Members of the panel, who are chosen from a reservoir of thousands of applicants, serve without remuneration.

Respondents gave many different reasons for choosing the brand of dentifrice currently used, but only 4.7 per cent of the replies related specifically to protection against dental disease (Table 1). Another 1.8 per cent of the respondents referred to a "special ingredient" as the reason for its purchase. A mere 1.1 per cent of the replies referred to advertising.

When similar reasons as written in by the respondents are grouped, it appears that "taste" is the most important single factor in the selection of a dentifrice. A total of 18.5 per cent of the respondents gave this reason, and another 9.0 per cent referred to the aftertaste. The other sizable group of answers referred to the cleaning properties of the dentifrice they used. One out of 18 said "dentist's recommendation" was why the present brand was used, and one out of 15 said "force of habit." A substantial number merely indicated they "liked" their present dentifrice, giving no indication as to why they liked it.

Replies to the multiple-choice question on type of dentifrice indicated that 7 out of 10 panelists (69.1 per cent) preferred tooth paste compared with about 2 out of 10 (21.8 per cent) who favored tooth powder (Table 2). Soda and salt were more popular than liquid dentifrice. A minority of respondents thought that ammoniated or chlorophyll dentifrice had an advantage over other dentifrices in the care of the teeth (Table 3). As the educational level of the respondent increased, confidence in ammoniated denti-

Table 1 • Percentage distribution of replies to the question: "What is the main reason why you use your present dentifrice rather than some other brand?"

Reason	Per cent
Clean taste	1.1
Pleasant taste—good taste	8.5
All other references to flavor and taste	8.9
Makes mouth feel cleaner, fresher	9.0
Sweetens breath	2.9
Cleans easily	2.1
Whitens teeth—cleans white	4.2
All other references to cleaning properties	10.4
Prevents or controls tooth decay	2.2
Best for teeth or mouth	.6
Helps prevent pyorrhea or gum disease	.7
All other references to protection against dental disease	1.2
Contains special ingredient	1.8
All references to advertising	1.1
Dentists' recommendation	5.5
Price	2.0
Force of habit	6.8
We like it—like results	12.7
Husband likes or prefers it	.7
Children like or prefer it	2.2
Other	15.4
Total	100.0

frice increased but confidence in chlorophyll dentifrice decreased.

In the questions on proper and actual time for brushing teeth (Table 4), the respondents wrote in the answers (these were not multiple-choice questions). Three out of five respondents (60.1 per cent) knew that teeth should be brushed after meals. Many of these added that teeth also should be brushed at some other time, such as after snacks, at bedtime, and so forth. But only half as many respondents (29.1 per cent) said they actually did brush teeth after every meal. When replies are tabulated according to frequency of toothbrushing, without regard to meals or time of day, it appears that a plurality of respondents brush their teeth twice a day, with those who brush their teeth three or more times per day a close second and those who brush their teeth only once a day a poor third.

As shown in Table 5, the percentage who thought that toothbrushing should begin as soon as the child has teeth increased as the amount of education increased. A considerably larger proportion of the low education group than of the high education group thought that toothbrushing could begin as late as 4 to 10 years of age. Respondents in the group with the highest education showed even more superiority in answering the question regarding the age at which the child should first be taken to the dentist (Table 6). This multiple-choice question was answered correctly by about half (48.1 per cent) of all respondents.

The question on factors related to poor teeth in children was a multiple-choice

Table 2 • Percentage distribution of replies to the question: "What type of dentifrice do you use?"

Type of dentifrice	Per cent
Tooth paste	69.1
Tooth powder	21.8
Liquid dentifrice	.8
Soda	3.9
Salt	3.3
Other	1.1
Total	100.0

Table 3 • Percentage distribution of replies to the question: "What kind of dentifrice do you think is best for the teeth?" according to educational level of respondent

Kind of dentifrice	Some or all of grade school	Some or all of high school	Some or all of college or business school	Total
Ammoniated dentifrice	16.9	24.4	27.0	23.4
Chlorophyll dentifrice	27.0	21.4	13.4	20.2
Plain dentifrice	18.7	16.7	14.1	16.3
It doesn't make much difference what kind is used	33.9	34.8	41.6	36.8
Other	3.5	2.7	3.9	3.3
Total	100.0	100.0	100.0	100.0

Table 4 • Percentage distribution of replies to the questions:
(1) "How often do you think a person should brush his teeth, and at what time or times of day should they be brushed?"
(2) "At what time or times of day do you brush your teeth and how often do you brush them?"

Times of day	Percentage distribution, replies to question 1	Percentage distribution, replies to question 2
After each meal	22.7	9.3
Three times daily after each meal	8.0	2.9
After each meal and at bedtime	14.6	7.3
After meals and after snack or eating	.9	.3
After meals, after eating at any time, and at bedtime	.3	.4
Morning, after meals and at bedtime	4.5	3.9
Morning and after each meal	3.0	2.4
After meals if possible, otherwise twice a day	2.9	.6
After each meal and before social engagements	.1	.6
After eating, regardless of time of day	3.1	1.4
After breakfast and after supper	2.4	3.1
After breakfast and before retiring	2.6	3.5
After breakfast	.0	1.0
Before breakfast and before retiring	1.1	2.1
Before breakfast and after supper	.3	.3
Before breakfast	.0	.6
Once a day—at least once a day	2.3	7.8
Twice a day—morning and noon or night	17.7	24.4
Three times a day—morning, noon and night	3.3	5.0
Four times a day	.3	.4
Once or twice a day	.2	.6
Two or three times a day	.3	.6
Three or four times a day	.6	1.0
Once a day and before going out	.1	1.1
Morning, evening and before going out	.2	1.1
Before retiring and before going out	.1	.4
At bedtime	1.2	3.7
Morning and before retiring	3.6	4.8
Other	3.6	9.4
Total	100.0	100.0

question, but 1.6 per cent wrote in "heredity" indicating they believed it to be more important than any of the factors listed (Table 7). More respondents checked the correct answer than any single wrong answer, although all wrong answers combined constituted a majority. The percentages varied, as might be expected, with the educational level of the respondent.

The series of seven questions covered in Table 8 were designed especially to yield information helpful in determining essential content of dental health education materials. The large majority of respondents (85.7 per cent) answered correctly the question regarding the practicability of straightening teeth. The misconception that pregnancy results in cavities in the mother's teeth is extremely widespread, even among college people. The misconception that eating foods with plenty of vitamins and minerals will prevent tooth decay is also very common.

A surprisingly large number of people (24.7 per cent) thought that a toothache did not necessarily require the attention of a dentist since it would often disappear by itself. Respondents with college education did much better than those with only grade school education on the question of whether decayed deciduous teeth should

Table 5 • Percentage distribution of replies to the question: "At what age in life should regular toothbrushing begin?" according to educational level of respondent

Age	Some or all of grade school	Some or all of high school	Some or all of college or business school	Total
Under 1 year	.4	.7	1.3	.8
1 year but less than 2 years	10.6	10.5	12.2	10.9
2 years but less than 3 years	25.9	33.8	27.0	29.8
3 years but less than 4 years	16.4	17.0	17.5	17.1
4 years but less than 5 years	13.7	9.8	7.3	9.8
5 years but less than 6 years	6.0	4.1	3.5	4.4
6 years but less than 7 years	4.8	2.9	3.1	3.3
7 to 10 years	1.4	.6	.1	.6
11 years and over	.6	.0	.0	.2
As soon as they have teeth	5.0	9.2	15.4	10.1
When child can hold toothbrush	3.2	2.8	1.6	2.6
As soon as possible	6.0	4.9	5.9	5.6
Other	6.0	3.7	5.1	4.8
Total	100.0	100.0	100.0	100.0

Table 6 • Percentage distribution of replies to the question: "At approximately what age do you think children should first be taken to see a dentist?" according to educational level of respondent

Age	Some or all of grade school	Some or all of high school	Some or all of college or business school	Total
At age 5 or just before starting school	41.9	35.7	30.1	35.4
At age 12 or 13, after most permanent teeth are in	3.3	1.5	1.1	1.8
At age 2½ or 3, after all primary (baby) teeth are in	34.3	48.4	58.2	48.1
When the child has his first toothache, or when a cavity is first noticed	20.5	14.4	10.6	14.7
Total	100.0	100.0	100.0	100.0

Table 7 • Percentage distribution of replies to the question: "Which one of the following do you think is most closely related to poor teeth in children?" according to educational level of respondent

Cause of poor teeth	Some or all of grade school	Some or all of high school	Some or all of college or business school	Total
The lack of vitamins in the diet	27.4	21.6	18.6	22.1
The lack of milk in the diet	31.6	26.2	26.5	27.6
The frequent eating of sweets	32.2	42.1	43.4	40.1
The lack of sunshine	3.5	1.8	.9	2.0
Heredity	.4	1.7	2.7	1.6
Other	4.9	6.6	7.9	6.6
Total	100.0	100.0	100.0	100.0

Table 8 • Percentage distribution of replies to seven questions regarding dental health concepts, according to educational level of respondent

Question and answers	Some or all of grade school	Some or all of high school	Some or all of college or business school	Total
Teeth which are irregular or crooked can nearly always be straightened				
Yes	82.9	84.3	89.6	85.7
No	6.9	7.8	5.3	6.9
No opinion	10.2	7.9	5.1	7.4
Total	100.0	100.0	100.0	100.0
The unborn child absorbs calcium from the teeth of the mother				
Yes	66.5	66.2	56.4	63.4
No	19.5	24.5	33.8	26.1
No opinion	14.0	9.3	9.8	10.5
Total	100.0	100.0	100.0	100.0
As a result of pregnancy, a mother is likely to develop cavities in her teeth				
Yes	79.5	82.0	76.0	79.6
No	12.4	13.9	17.8	14.7
No opinion	8.1	4.1	6.2	5.7
Total	100.0	100.0	100.0	100.0
Eating foods with plenty of vitamins and minerals will prevent tooth decay				
Yes	76.8	66.2	69.3	69.7
No	14.8	23.4	24.3	21.6
No opinion	8.4	10.4	6.4	8.7
Total	100.0	100.0	100.0	100.0
A toothache does not necessarily require the attention of a dentist since it will often disappear by itself				
Yes	34.3	22.0	21.1	24.7
No	60.9	74.3	75.5	71.5
No opinion	4.8	3.7	3.4	3.8
Total	100.0	100.0	100.0	100.0
Primary (baby) teeth which have decayed usually should be filled even though they will be replaced by permanent teeth later				
Yes	71.6	83.2	90.4	82.8
No	21.3	12.1	5.6	12.2
No opinion	7.1	4.7	4.0	5.0
Total	100.0	100.0	100.0	100.0
The six-year molars are eventually replaced by permanent teeth				
Yes	50.4	37.1	33.3	39.0
No	33.3	46.7	54.5	46.0
No opinion	16.3	16.2	12.2	15.0
Total	100.0	100.0	100.0	100.0

be filled. The number of people replying correctly to this question appears larger than might be expected (82.8 per cent). More people declined to give an opinion on the question regarding permanence of six-year molars than any other question; of those who did answer almost as many checked the wrong as the right answer.

The analysis of this survey will continue in subsequent issues of THE JOURNAL.

B. Duane Moen, Director

BUREAU OF LIBRARY AND INDEXING SERVICE

The American Dental Association Film Library

The film reviewed herein was shown on the motion picture program at the ninety-fourth annual session at Cleveland. It has been added recently to the Film Library collection and may be rented for $2.50. Since the number of prints is necessarily limited, it is suggested that program chairmen plan their programs far enough in advance to insure availability of the film.

FILM REVIEW

Correction of Anterior Open Bite • 16 mm., color, magnetic sound, 575 ft., 18 minutes. Produced in 1953 by the University of Minnesota School of Dentistry. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago, or on purchase from the University of Minnesota School of Dentistry.

This film demonstrates the correction of a case of anterior open bite by means of a bilateral Y-shaped ostectomy and osteotomy. The procedure is accomplished in two steps: an intraoral operation which is performed in the dental clinic and an extraoral operation, the osteotomy. The osteotomy is performed in a hospital operating room. Care is taken so that the mandibular canal is unharmed.

The film opens showing a male patient who has an anterior open bite caused by a protruding upper right cuspid and a peg-shaped lower right cuspid. In the ostectomy, the removal of a Y-shaped segment of bone is illustrated by animated drawings before it is demonstrated on the patient. Mandibular block anesthesia is used for the actual operation. After the mucoperiosteal flap has been sutured, the edges of the wound are shown in good apposition.

The second stage, the osteotomy, completed ten days after the ostectomy, is also first demonstrated with animated drawings. Finally the patient's mandible is immobilized by intermaxillary wiring. Intraoral close-ups taken ten weeks postoperatively show improved occlusion. Similar procedures are carried out on the left side of the patient's mouth. The film concludes with "before and after" roentgenograms, photographs and intraoral close-ups which show successful correction of the anterior open bite.

This is an interesting, well organized film. The photography is very good. The use of a variety of visual technics increases the film's instructional value. It is suitable for postgraduate dental students, hospital dental staffs, oral surgeons and prosthodontists. Dental societies may find it stimulating program material.

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Editorials

Members urged to participate in dental Relief Fund program

November, long since, has been known to Association members as Relief Fund month—the month in which dentists traditionally respond to the spirit of Thanksgiving by contributing to the American Dental Association Relief Fund. Once again the Council on Relief asks your help in the yearlong task of lightening the burden of distress that afflicts a few fellow practitioners less fortunate than yourself. Once again the Council on Relief solicits your support by mailing you a small packet of Relief Fund Seals. Income from the sale of these seals is the only source of revenue available to the Association in dentistry's self-imposed task of aiding needy members and their dependents.

For the benefit of the younger and perhaps uninformed member, it may be repeated that the American Dental Association Relief Fund was established almost a half century ago—in 1907—for the sole purpose of aiding dentists and their dependents in distress. During the intervening years it has provided financial assistance to hundreds of needy members of the profession. The American Dental Association Relief Fund is a perpetual charitable trust. One half of the contributions received from the annual sale of Relief Fund Seals is deposited in this trust and one half returned to the constituent dental societies. By action of the House of Delegates last September the cost of operating the Relief Fund in the future will be borne by the Association—not by the Fund itself as formerly. That portion of the contributions retained by the Association Relief Fund is protected legally from attachment, and only the interest therefrom can be used for relief purposes. The principal must be kept intact. An applicant for aid is investigated, and when his application is approved he receives a financial grant. One half of each relief grant is paid by the American Dental Association Relief Fund and one half is paid by the constituent and component dental society in whose jurisdiction the recipient resides.

Last year, for the first time in the near half-century history of the Fund, contributions passed the $100,000 goal set by the Council on Relief. The total contributions amounted to $103,461.89, and thirty-six constituent dental societies reached or exceeded their respective quotas. It is anticipated that total contributions to the 1953-1954 Fund drive, now under way, will exceed last year's mark by at least fifty per cent—a modest sum and a modest goal considering the Association's total membership of seventy-nine thousand.

Again let is be said for the uninformed member who may ask what a dental relief case may mean—it means that a fellow practitioner who once was as sturdy as you has met obstacles that he cannot surmount unaided—perhaps chronic illness—perhaps long hospitalization—perhaps a broken home and a complete change in a way of living. Your contribution—prompt and generous—will help remove some of those obstacles for some fellow practitioner. Please acknowledge the receipt of the Relief Fund Seals with a contribution truly significant of the spirit of Thanksgiving.

Accreditation of hygienist training courses one key to greater dental service

Dentistry recently passed another milepost in its effort to improve its service to society. The latest achievement, recorded in a report of the Council on Dental Education published in the September issue of THE JOURNAL,[1] consists of the first nation-wide evaluation by that Council of training programs for dental hygienists. Schools for dental hygienists have existed in this country for the past forty years, yet this year marks the first time that their teaching programs have been evaluated by standards established by an authorized agency of the profession. Although the report has caused little or no stir in current dental circles, it undoubtedly will be regarded by dental historians as of significant value.

Lest the full significance of the report be lost, certain items in it or pertinent to its contents are here pointed up: (1) Twenty-nine teaching institutions in the United States now offer a full two-year course of instruction in dental hygiene. (2) Of these schools, the Council on Dental Education has given full approval to eighteen and provisional approval to three—twenty-one in all—and decision on the remaining eight schools is pending. (3) About one thousand hygienists are being graduated annually. (4) Approximately eight thousand hygienists are currently licensed. (5) Dental schools are teaching students how to work efficiently with hygienists and other auxiliary personnel. (6) Dental hygienists now are licensed to practice in every state and territory in the union.

The need for more qualified personnel to assist dentists so that dentistry can widen the scope of its services is well established. As Dr. Howard A. Rusk, chairman of the Health Resources Advisory Committee, Office of Defense Mobilization,[2] points out in this issue of THE JOURNAL: "There must be a continuing study of personnel utilization to assure that professional and technical skills are put to best use. We may well be faced with a national emergency unless steps are taken to make better use of professional skills, and to recruit, train and utilize auxiliary workers."

Fortunately, the Council on Dental Education, as evidenced by its September report, has cooperated closely and energetically with educators to recruit more dental workers. However, steps taken to date have not enabled the profession to keep up with the increasing demands of a growing population, the needs of the armed services, the extension of public health activities and the expansion of industrial dental programs. Furthermore, trends indicate that the ratio of dentists to population will present an even greater challenge to the profession in the future. Our present population of 160 million according to the United States Census Bureau[3] is double that of 1903 and, the Bureau estimates, if the current rate of growth continues, our population by 1975 will have grown to 221 million or 61 million more than at present. Obviously, it is impossible for the present number of dental schools to graduate dentists in sufficient numbers to care for the dental demands of the country's growing population. Obviously, the profession must learn to employ auxiliary personnel, including dental hygienists, if it is to serve the America of tomorrow effectively.

The action of the Council on Dental Education in establishing basic educational requirements for the accreditation of schools of dental hygiene, and its recognition of the dental hygienist as an important, almost indispensable member of the dental health team must be recognized as a signal contribution to dental education, to dental service and to the dental health standards of America.

1. Council on Dental Education. Accreditation of dental hygiene programs. J.A.D.A. 47:338 Sept. 1953.
2. Rusk, Howard A. Dental manpower mobilization and the cold war. See page 501 of this issue.
3. Is U. S. getting too crowded? U. S. News and World Reports, Sept. 11, 1953, p. 18.

W. Earle Craig, third district trustee, dies

Friends of W. Earle Craig were saddened to learn of his death on October 6, less than a week after he had been reelected trustee from the Third District at the ninety-fourth session of the Association. Born in 1896, Dr. Craig was graduated from the Dental College of the University of Pittsburgh in 1918 and after serving one year as a first lieutenant in the Army Dental Corps during World War I, he devoted his entire professional life to the practice of general dentistry and to dental society affairs. His twenty-five years as secretary of the Odontological Society of Western Pennsylvania terminated in his being president of that organization in 1935. He twice served as vice-president of the Pennsylvania Dental Society and once as its president. For many years he was a delegate from the Third District and had just entered his second term as trustee. Always civic-minded, he was a director of the General Health Council of Allegheny County; dental adviser, Allegheny County Board of Assistance, and member of the Health Advisory Board of the Pittsburgh Department of Health. He was associate editor of *Oral Hygiene* and author of *Information for the General Practitioner* and numerous other articles. Dr. Craig's devotion to his profession, his efforts to advance the standards of dentistry and his interest in human affairs endeared him to his patients and commanded the esteem of his fellow practitioners. He is survived by his wife, three daughters and a son.

Dental membership in the American Association for the Advancement of Science

In March 1953 the American Association for the Advancement of Science, through the cooperation of the American Dental Association, circularized the American Dental Association membership with an invitation to join the A.A.A.S. The Council on Dental Research urges that as many members of the Association as possible accept this invitation.

The number of dental members, as reflected in the 541 members of the Subsection ND, Dentistry, of the A.A.A.S. is small in comparison to the representation of many other professions. Since its founding in 1848, the total membership of the A.A.A.S. has increased to about 50,000.

The American Association for the Advancement of Science is by far the largest federation of scientific and related professional organizations in the world. It consists of 245 affiliated and associated organizations. Dentistry is represented in this group by the International Association for Dental Research and the American College of Dentists as affiliated societies, and the American Dental Association and the American Association of Dental Schools as associated societies.

This year's one hundred and twentieth meeting of the A.A.A.S. will be held in Boston, December 26 to 31. It presents an unusual opportunity for the dentists in New England and New York to promote intercourse between them and the country's outstanding scientists and professional men. Two general symposiums have been scheduled: on December 27, "Species Which Feed Mankind" will deal with the basic food sources of man, and on December 29, "The Sea Frontier" will consider many of the phenomena of the common boundary of land and sea. These general symposiums are important to all. The specific program of Subsection Nd (Dentistry) includes three sessions, all of which will be held on December 29. These programs were arranged by Howard R. Marjerison, director of The Forsyth Dental Infirmary for Children. One of the three sessions will be a symposium, "Recent Animal Experimentations in Caries Research," arranged by Reidar F. Sognnaes, professor of oral pathology, Harvard School of Dental Medicine.

Similar opportunities for attending the A.A.A.S. will be afforded the dentists of the West Coast since the 1954 meeting will be held in Berkeley, California, and for the dentists in other regions since the 1955 meeting is to be held in Atlanta, Georgia; in 1956, New York City; in 1957, Indianapolis, Indiana, and in 1958, Washington, D. C.

The annual membership dues of $6.50 include a subscription to *Science* or *The Scientific Monthly* (or both magazines will be included for $10). Probably *The Scientific Monthly* will be of more general interest to the practitioner than *Science* which is designed primarily for the researcher. Application for membership should be forwarded to the American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington 5, D. C.

Among the publications of the A.A.A.S. of special interest to dentists are the symposium volume, *Dental Caries and Fluorine*, published in 1946, which is available from the A.A.A.S. at $3.50 for non-members and $3 for members, and another volume, *Fluoridation as a Public Health Measure*, which is in preparation.

International Correspondence

NEWS FROM GREAT BRITAIN

In this, my first letter to THE JOURNAL as British correspondent, perhaps I should explain the many aspects of British dentistry which must be considered in gaining a balanced perspective of the dental scene in Great Britain.

Below is a list of the organizations and interests whose activities should be reported, together with the names of my colleagues who will keep me informed about each.

National Health Service • This scheme now has been in existence since July 1948, and more than 95 per cent of the dentists have taken part in it. It is true to say that during the last five years, more of the population in Great Britain have received dental treatment than ever before, and equally true that during the five years members of the dental profession have earned greater incomes than ever before, though these are on the decline at present.

Yet the service is in many ways unsatisfactory, and members of the profession at the present time feel they are suffering under grave injustices.

It will be our purpose to give you a picture of the current situation, with the help of John W. Gilbert, who though outside the Health Service himself, has an unrivalled knowledge of the problems involved.

British Dental Association • The B.D.A. represents organized dentistry in Great Britain. There is no other national dental association; and with its 11,000 odd membership, it can be said to represent and speak for the bulk of the profession.

During the last six or seven years its activities have been chiefly concerned with protecting the rights of the profession in its impact with the Ministry of Health, the Government department responsible for implementing the National Health Service. Not everyone is in agreement with Association policy, and the present impasse between the Ministry and the Association concerning remuneration, the introduction of ancillary services and the passing of a new Dental Bill, is a very disturbing factor.

W. Stewart Ross, who has given many years of service to the British Dental Association and is now a member of Council, and who is also chairman of the Council of the International Dental Federation, can bring an international viewpoint to bear on these problems which we hope will interest you.

The Faculty of Dental Surgery of the Royal College of Surgeons of England • The College is primarily an examining body, but it is also a most important center of postgraduate teaching and research. Fellowship of the College is an essential prerequisite for consultant status in any branch of surgery. For nearly 100 years, the College has given examinations in dental surgery and has awarded a diploma, L.D.S.R.C.S., which entitles a man to practice.

Six years ago a dental faculty was formed within the College by Royal Charter, and a Fellowship in Dental Surgery (F.D.S.R.C.S.) was created to serve as evidence of postgraduate training for consultant work in dentistry. A Board of Faculty was formed, which under the Council of the College conducts all dental business relating to undergraduate examinations and postgraduate teaching, lectures, research and examinations. It is one of the closest and most valued links between dentistry and general surgery in Great Britain.

The Dental Board of the United Kingdom • Until 1921 anybody was allowed to practice dentistry in Great Britain, whether qualified or not, but the General Medical Council had the statutory duty of keeping a register of those who held a University or College degree or diploma.

In 1921 it was made illegal to enter practice without holding a registrable qualification, and the Dental Board was set up by an Act of Parliament to keep the register and maintain discipline in the profession. The Board was given powers to levy an annual "retention fee" of an amount up to £5. on all dentists subsequently registered and could spend its surplus funds on public matters related to dentistry. The Board is, however, still under the tutelage of the General Medical Council in many respects and particularly in matters of dental education and examination.

E. Wilfred Fish, one of the most prominent

members of the dental profession in Great Britain, is chairman of the Dental Board and an original member of the Board of Faculty of the Royal College of Surgeons, and is admirably suited to give the viewpoints of these two very important bodies.

The Dental Schools and the Academic Body of the Dental Profession • There are 16 dental schools in Great Britain and Northern Ireland; and although each has its individual characteristics, they are closely united in their common problems.

The standard of dental education has improved out of all recognition during the last 25 years, and the strength of the academic body responsible for the teaching is a very important factor in British dentistry.

The prospects of an academic career, both from a financial and status angle, have increased markedly during the last few years, and Prof. H. H. Stones in his capacity as dean of the University of Liverpool Dental School and editor of the *International Dental Journal* is well able to bring a wide and experienced view to the picture of this important section of British dentistry.

Current Research and Its Progress • Never before in the history of British dentistry has there been so much active research going on in almost every dental school in the country as there is at present. There is close liaison with dental research groups in many parts of the world, especially the United States, through the British section of the International Association for Dental Research, with which Prof. M. A. Rushton is closely connected in this country.

With the help of Prof. Rushton, we look forward to being able to give from time to time news of any important work presented to the dental profession in Great Britain.

The Private Practitioner Not in the Health Service • This is the smallest group of dentists in Great Britain, numbering a few hundred in all, but an intensely live, active group, fortunate in its ability to maintain complete freedom of thought and action, proud of its efforts to maintain standards and to introduce new technics and methods to the profession.

Representative of this group is C. de Vere Green, president of the American Dental Society of London, consultant dental surgeon at University College Hospital and teacher at the Dental School, who will help to keep us up-to-date with this group's activities.

It will not be possible, of course, to cover all these sections each month, but it will be our aim to present to the readers of THE JOURNAL a reasonably comprehensive picture of current thought in Great Britain throughout the year. I hope our efforts will be satisfactory.

G. H. Leatherman, D.M.D., F.D.S.R.C.S.

Washington News Letter

After many weeks of delay, Department of Defense and Selective Service procedures under the newly revised "doctor draft law" were finally issued the second week in October. The law itself was enacted and approved last July, and the delay in the promulgation of regulations is due in part to touchy feelings existing between the Pentagon and General Hershey's office.

In any event, the policies of both agencies have now been laid down, and they are of considerable importance—notwithstanding the fact that the armed services intend to place no induction calls for dentists or physicians before next July. For in the interim, classification of special registrants by local draft boards will continue; satisfactory disposition, short of involuntary induction, will have to be made of younger dentists who are vulnerable to the regular draft as well as the special "doctor draft," and thousands of dentists now on active duty will be eligible for promotions in accordance with a formula that has now been promulgated.

Defense Department Directive No. 1205.1 abolishes eleven sundry rulings and regulations dating back to the original "doctor draft law" of 1950 and presents a codification of present-day procedures. It prescribes professional qualifications of special registrants, specifies that lowered physical requirements adopted last December shall be retained and sets forth procedures for granting military commissions.

General Hershey's directive implements Part VIII, Paragraph 5, of the Pentagon document with reference to "double jeopardy" dentists and physicians. The latter states: "Special registrants who are also regular registrants may be commissioned by a military department upon receipt of documentary evidence indicating that such special registrants have, as regular registrants, been placed by their local boards in a class available for military service . . ."

Selective Service headquarters now has instructed state directors to do their part to the end that no dentist willing to accept a Reserve commission shall be inducted as a private. When a dentist is placed in 1-A under provisions of the regular draft law, he is to be notified by his local board that he has the alternative of filing application for a commission within 30 days. Failing to do so, he may be liable to induction.

Heretofore, the Armed Forces have been entertaining applications only from those who volunteered for immediate active duty. Since they are now faced with surpluses of physicians and dentists, at least for the remainder of the fiscal year ending next July 1, the doors have been swung shut on prospective applicants. In order to avert induction of "double jeopardy" registrants, the military is relaxing its rule against creation of more officers and is offering them commissions without requiring immediate active duty.

VA OUTPATIENT DENTAL CARE

Another October government directive of much significance was that of the Veterans Administration, drastically curtailing its outpatient dental care responsibilities. Identified as Emergency Interim Issue (EM10-48), the document terminates so-called "lifetime care" of dental defects which are service-connected. John Fauber, assistant chief medical director of the Department of Medicine and Surgery in charge of dental operations, estimates that the new order will automatically disqualify nearly one half of the more than 300,000 veterans who were on waiting lists as of October 1.

A week after the order had been sent out to the field, Washington headquarters of the VA still had received no measurable volume of protest from veterans' groups or other organizations. With the $23,000,000 available this fiscal year for fee-basis dental care, and with regional VA offices being directed to step up outpatient treatments, it is certain that the backlog of eligible patients will be reduced to a comparative trickle within the next seven months.

Veterans having service-connected, noncompensable dental disabilities comprise approximately 98 per cent of the potential patient load. Until issuance of the VA directive, these beneficiaries could receive treatment indefinitely. This unusually liberal policy was the subject of considerable discussion and controversy at hearings conducted last July by the House Veterans Committee.

"Upon one-time completion of dental treatment authorized under this class," says the VA's new ruling, "no further outpatient dental treatment may be furnished unless the dental services rendered on a one-time basis are found unacceptable within the limitation of good professional standards or the veteran beneficiary is found eligible under one or more of the other dental benefit classifications. Cases under treatment as of the date of this issue will be completed as authorized."

Thus a carious tooth, adjudicated to be service-connected, will be filled and that will be all. An adjacent tooth which subsequently becomes carious or infected will not be treated at government expense on grounds that it affects, or may have been affected by, a service-connected tooth.

This restriction of responsibility is not applicable to service-connected, compensable dental conditions or to cases in which dental defects are found to aggravate or have a bearing upon a systemic disorder. Nor is there to be any change of policy with regard to beneficiaries in vocational training or Spanish-American War veterans.

ANNUAL SESSION OFFERS PLAN FOR VA PROGRAM REVISION; HITS MISLEADING ADVERTISING, ELECTS OFFICERS

The dental profession voiced its opposition to misleading advertising of dental products, the sale of carbonated beverages and candy in schools and the production of motion pictures and television programs detrimental to dentistry at the 94th annual session of the American Dental Association, September 28-October 1 in Cleveland.

The House of Delegates also reiterated its support of fluoridation as a safe, effective dental health measure; rejected proposals to include dentists in the Old Age and Survivors' Insurance program; suggested revision of the VA outpatient dental care program, and urged greater support for proposed regionally-based systems for professional education.

Atlantic City was chosen as the site of the 1956 annual session, and Sen. Lester C. Hunt (D., Wyo.) was unanimously elected an honorary member of the Association. Attendance at the annual session topped 9,000.

ELECTION OF OFFICERS

Leslie M. FitzGerald, oral surgeon of Dubuque, Iowa, assumed the presidency of the Association in closing sessions of the annual session, succeeding Otto W. Brandhorst of St. Louis.

Daniel F. Lynch, oral surgeon of Washington, D. C., was elected to the office of president-elect. Vice-presidents of the Association for 1953-54 are Walter J. Pryor of Cleveland, who was chairman of the local arrangements committee for the 94th annual session, first vice-president; Charles A. Pankow of Buffalo, N. Y., second vice-president; H. O. Warrick of Enid, Okla., third vice-president.

Harry Lyons of Richmond, Va., who presided as speaker of the House, was re-elected to that post by acclamation of the House.

Lon W. Morrey of Chicago was reappointed editor of the Association for a three-year term, and H. B. Washburn of St. Paul was reappointed treasurer for one year. These were the only officers of the Association to be appointed this year, as Harold Hillenbrand, secretary, was reappointed last year to a term of three years.

ELECTION OF TRUSTEES

New trustees elected to the Board to replace those whose second term had expired are: Edward R. White of Jersey City, N. J., Fourth District, succeeding Daniel F. Lynch; Howard B. Higgins of Spartanburg, S. C., Fifth District, succeeding James E. John; Paul H. Jeserich of Ann Arbor, Mich., Ninth District, succeeding Obed H. Moen.

Re-elected to second terms on the Board were trustees L. H. Jacob of Peoria, Eighth District, and the late W. Earle Craig of Pittsburgh, who died one week after his re-election. Because of his illness, Dr. Craig was unable to attend the Board meetings at the 94th annual session, and Charles H. Patton of Philadelphia was named to serve temporarily in his place.

HONORARY AND ASSOCIATE MEMBERS

Sen. Lester C. Hunt, senior Senator from Wyoming and the only dentist member of the United States Senate, was elected

Leslie M. FitzGerald, oral surgeon of Dubuque, Iowa, assumed the presidency of the American Dental Association at the general meeting of the annual session on September 29, 1953. Dr. FitzGerald, who has practiced oral surgery in Dubuque for 32 years, is a past president of the American Society of Oral Surgeons, the Iowa Dental Society and the Dubuque Dental Society. He is a co-founder, diplomate and secretary of the American Board of Oral Surgery and since 1945 has served as chairman of the committee on oral surgery of the American College of Dentists. In service to the Association, Dr. FitzGerald has been a member of the editorial board of the Journal of Oral Surgery since 1950, chairman of the advisory committee to the Bureau of Economic Research and Statistics for several years and previously was a member of the committee on economics for 14 years. He has served as a member of the House of Delegates since 1929 and as chairman of the Section on Oral Surgery.

Walter J. Pryor of Cleveland, chairman of the local arrangements committee for the 1953 annual session, was elected unanimously to the office of first vice-president of the Association. Dr. Pryor, a prosthodontist, is a graduate of Western Reserve University School of Dentistry and has been in practice since 1910.

Charles A. Pankow of Buffalo, second vice-president, has been president of his state, district and local dental societies and legislative chairman of his state society. A private practitioner for 48 years, he is a professor at the University of Buffalo dental school, a staff member of the Buffalo General Hospital and a member of his county health board.

Hollis O. Warrick of Enid, Okla., third vice president of the Association, is a graduate of the Texas Dental College and has been in general practice for 36 years. A member of the House of Delegates for many years, he has served on various reference committees during annual sessions. He is a past president of both his local and state dental societies.

Harry Lyons of Richmond, Va. (top), speaker of the House of Delegates, is dean of the Medical College of Virginia School of Dentistry. He was a member of the Council on Dental Therapeutics for 17 years, and former chairman of the Association's nomenclature committee and committee on national emergency dental service. He is a past president of the Virginia State Dental Association.

H. B. Washburn of St. Paul (center), Association treasurer, was president of the American Dental Association in 1947-48. Previously he served two terms as an Association trustee and also has served as president of the St. Paul District Dental Society and the Minnesota State Dental Association. He has been in private practice since 1905.

Lon W. Morrey of Chicago (bottom) has been editor-in-chief of the Association since February 1947. Previously he was in private practice and served as school dentist at Lake Forest, Ill. He was a pioneer director of the dental division of the Illinois State Department of Health and ultimately, chief of the dental health division, Chicago Board of Health. He was director of the Association's Bureau of Public Relations, 1933-46.

Daniel F. Lynch of Washington, D. C., new president-elect of the American Dental Association, has served as trustee from the Fourth District, secretary of the research commission and chairman of the international relations committee. An oral surgeon, Dr. Lynch was graduated from the Baltimore College of Dental Surgery in 1925 and served internships at Fifth Avenue Hospital, New York, and the Mayo Clinic, Rochester, Minn. He is a consultant and lecturer at the Army Medical Center and the Naval Dental School and consultant to the Air Force, VA and USPHS. A prolific essayist, Dr. Lynch is a fellow of the American College of Dentists, International College of Dentists, Royal College of Surgeons (Eng.) and New York Academy of Dentistry. He is past vice-president and executive council member of the Fédération Dentaire Internationale and is an honorary member of 18 foreign dental societies.

unanimously to honorary membership in the American Dental Association "for the outstanding contributions he has made."

His nomination, submitted to the House by the Board of Trustees, stated: "Senator Hunt, in his capacity of governor, senator and member of the dental profession, has rendered distinguished service to his state, to dentistry and to his country. The dental profession and the Association are proud of the contributions he has made."

Associate memberships were awarded Alphonse Frank Forziati, research fellow of the Association at the National Bureau of Standards, and Leroy R. Boling, professor of anatomy and dean of the School of Dentistry, Washington University, St. Louis.

LIFE MEMBERSHIPS

A total of 538 dentists representing 45 states, the District of Columbia, the Army and the Veterans Administration were elected to life membership in accordance with Association bylaws which require that nominees be 65 years old and active members of the Association for 35 years.

The following constituent societies are represented: Alabama, 5; Arizona, 1; Arkansas, 6; Army, 2; California, 16; Southern California, 8; Colorado, 11; Connecticut, 5; District of Columbia, 3; Florida, 4; Georgia, 7; Idaho, 1; Illinois, 60; Indiana, 11; Iowa, 27; Kansas, 5; Kentucky, 23; Louisiana, 1; Maine, 3; Maryland, 2; Massachusetts, 23; Michigan, 29; Minnesota, 21; Mississippi, 4; Missouri, 31; Montana, 4; Nebraska, 8; New Hampshire, 1; New Jersey, 8; New Mexico, 5; New York, 39; North Carolina, 3; North Dakota, 3; Ohio, 37; Oregon, 5; Pennsylvania, 33; Rhode Island, 3; South Carolina, 7; South Dakota, 5; Tennessee, 5; Texas, 16; Utah, 4; Vermont, 2; Veterans Administration, 1; Virginia, 11; Washington, 9; West Virginia, 10; Wisconsin, 5; Wyoming, 5.

SCIENTIFIC SESSIONS

Audiences ranging from 1,000 to 2,000 persons attended the three scientific symposiums on "therapeutic" dentifrices, new anesthetics and denture service, which were presented on three consecutive mornings by combined scientific sessions.

No dentifrice has been proved to prevent tooth decay or periodontal diseases, the first panel concluded, and even promising results of carefully controlled clinical studies are not duplicated in the dentist's practice, where the patient cannot be checked on or disciplined.

Participants included Helmut Zander of Minneapolis, who spoke on antibiotics in dentifrices, now prescribed only for rampant caries; Robert G. Kesel of Chicago, who described his research on ammoniated dentifrices, which were designed to enhance naturally existing defense mechanisms; John W. Hein of Rochester, N. Y., who explained present laboratory tests of chlorophyll derivatives; Leonard S. Fosdick, who contended that clinical tests of antienzyme dentifrices must be performed to determine their effect in preventing caries; Albert H. Kniesner of Cleveland, who warned that medicated dentifrices are not as effective in dental practice as "the judicious use of the toothbrush."

Thomas J. Hill of Cleveland, moderator of the panel, summarized the symposium and selected questions from the audience to be answered by individual panelists. A total of 2,000 persons attended the discussion.

Other Symposiums • A discussion of the new combinations of anesthetics, new cortisone-type anesthetics and new technics of anesthetizing the patient was presented in the second symposium, September 30.

Participants included Floyd D. Ostrander of Ann Arbor, Mich., moderator; Sidney Epstein of San Francisco, on the pharmacology of local anesthetics; Robert A. Hingson of Cleveland, on the pharmacology of general anesthetics; Morgan L. Allison of Columbus, Ohio, on application of anesthetics in minor oral surgery; George W. Teuscher of Chicago, on application of anesthetics in pedodontics; John I. Ingle of Seattle, on application of anesthetics in operative dentistry and endodontics.

"Denture service for your patient," the October 1 symposium, was presented by Frank C. Hughes of Indianapolis; Stephen G. Applegate of Detroit, LeRoy E. Kurth of Chicago and S. Howard Payne of Buffalo. The discussion included diagnosis and prognosis, functional impressions, centric relation and mandibular movement and denture base materials and reliners. Victor H. Sears of Salt Lake City was moderator.

In other meetings of the eleven scientific sections, 35 essayists participated. In the table clinic program, a total of 198 presentations were given Tuesday and Thursday afternoons. Other features were the motion picture program, technical exhibits and scientific exhibits.

SCIENTIFIC EXHIBIT AWARDS

The best scientific exhibits in each of four classifications were awarded prizes by the Council on Scientific Session. Exhibits on dental subjects were classified according to whether they were prepared and

An audience of more than 2,000 (above) attended a highlight of the annual session's scientific program—the panel discussion, "Is there a therapeutic dentifrice?" which was presented September 29 in the Cleveland Public Auditorium by (inset, l. to r.) Albert H. Kniesner of Cleveland, Helmut A. Zander of Minneapolis, Robert G. Kesel of Chicago, chairman H. B. G. Robinson (standing) of Columbus, moderator Thomas J. Hill of Cleveland, John W. Hein of Rochester, N. Y., and Leonard S. Fosdick of Chicago.

presented by an individual, an association or institution or a federal agency. Exhibits on general information were classified separately. Winners were:

Individuals • Philip T. Williams of Anita, Iowa, first; Harry Kazis and Albert J. Kazis of Boston, second; Jacob C. Lifton of New York, third.

Associations and Institutions • Loyola University, Chicago College of Dental Surgery, first; University of Kansas City School of Dentistry and School of Medicine, second; University of Washington School of Dentistry, Seattle, third.

Federal • Federal Civil Defense Administration, Red Cross and Navy Bureau of Medicine and Surgery, first; Navy Dental Research Facility, Great Lakes, Ill., second; Walter Reed Army Medical Center Dental Division, third.

General Information • American Medical Association, first; American Dental Hygienists Association, second; American Dietetic Association, third.

ACTIONS OF THE HOUSE OF DELEGATES

The House of Delegates, composed of 390 delegates representing 54 constituent societies, met four times, with Speaker Harry Lyons presiding. The actions of the 1953 House include the following matters of importance to the dental profession and the public which it serves:

VA DENTAL CARE PROGRAM

"The federal government's obligation for service-incurred dental conditions of the veteran should be no more than the correction of the dental diseases or injuries incurred by him while in service," asserted the House in its proposals for revision of the VA outpatient dental care program.

A thorough dental examination of the serviceman both when he enters the service and when he is discharged was suggested as the means to determine the extent of treatment to which the veteran is entitled. To implement this plan, it was recommended that the Army transmit these examination records to the VA at the time of the serviceman's discharge.

The House criticized the fact that the basic laws or regulations governing the veterans' entitlement to dental care do not specify the standards presently applied to determine service-connection.

The House also objected to "the VA ruling that a diseased tooth, rather than the disease itself, is a service-connected dental condition," thereby making the federal government liable for its maintenance and replacement.

The treatment should be provided within a reasonable time after discharge, the House statement said; after correction of his service-incurred dental diseases or injuries, the veteran no longer should be entitled to the dental services provided by the Veterans Administration.

The House resolution is worded as follows:

Resolved, that the appropriate agencies of the Association take the necessary steps to urge the Veterans Administration, or Congress if that proved necessary, to revise the tests for determining entitlement to Veterans Administration outpatient dental services in accordance with this statement of policy and be it further

Resolved, that nothing in this statement of policy should be construed to apply to the

present system for providing dental services in Veterans Administration hospitals and domiciliary institutions or to the present system for providing outpatient dental care (1) to veterans whose dental conditions have been professionally determined to be aggravating a service-connected medical condition; and (2) to veterans whose service-connected dental conditions have been determined to be disabling and compensable.

Rejection of Other VA Revisions • The adoption of the above program led to the rejection of constituent society resolutions suggesting various other alternate plans for revising the VA outpatient dental care program.

The House also rejected a resolution calling for allowance payments instead of fee payments to dentists in the VA program, and it rescinded a resolution adopted in 1952 directing the Association to assist constituent societies in obtaining fee schedules based on cost-of-living increases.

SCOPE OF ORAL SURGERY

An official reply will be sent to the American Medical Association's House of Delegates concerning its recent action in regard to the practice of oral surgery.

At its June meeting, the A.M.A. adopted the following definition of oral surgery, after rejecting the one offered by the American Dental Association: "Dental-oral surgery is to be limited to diseases of the teeth and jaws and lesions of contiguous soft tissues related to diseases of the teeth and jaws but excluding malignancies."

The House of Delegates of the American Dental Association on September 30 authorized its Board of Trustees to transmit to the American Medical Association a statement prepared by the Special Committee on Problems in the Field of Oral Surgery, which reads in part:

"The definition of oral surgery offered by the American Medical Association is not acceptable as a substitute for the definition offered by the American Dental Association for a variety of reasons. The definition is not well-conceived nor is its language precise and exact. The exclusion of 'malignancies,' for example, from the scope of oral surgery should not be subject to the unilateral pronouncement of professional groups. As the malignant character of a lesion frequently can not be determined until after the initiation of surgery, the dental profession takes the position that malignant lesions should be treated under procedures determined by, and acceptable to, the health team at the local level which is concerned with the total health care of the patient."

SUGAR AND DENTAL CARIES

"The need for eliminating from the schools the sale of sweetened beverages and confections" was stressed by the House in its resolution approving the statement of the Council on Dental Health and the Council on Dental Therapeutics, *Sugar and Dental Caries.*

The delegates further recommended to the public voluntary restriction in the consumption of sweetened beverages and confections and pointed out to manufacturers of sweetened beverages and confections their responsibility for devising methods to eliminate the dental health hazards associated with the consumption of their products.

The joint statement of the Councils, which was published in the October issue of THE JOURNAL, declared that many years of dental research had established a significant relationship between sugar-consumption and dental caries.

MISLEADING ADVERTISING

Misleading advertising of dental products was condemned and dentists were urged to advise their patients of scientific information and preventive measures as part of their daily practice, in a joint resolution of the Council on Dental Therapeutics and the Council on Dental

Health which was adopted by the House of Delegates.

Advertising claims based on inadequate scientific evidence "are detrimental to public health since they tend to discourage well-recognized and acceptable dental health procedures," the House resolution stated. The motion reads:

Resolved, that the American Dental Association call attention of the public in the strongest possible terms to the serious danger to health which arises out of the present flood of inaccurate and untruthful claims in advertising for dentifrices and other dental products, and be it further

Resolved, that the manufacturers of these products and their advertising agencies be urged to cease those practices which tend to destroy the confidence of the public in the integrity of all advertising and in the reliability of all advertised products and services, and be it further

Resolved, that the members of the dental profession be urged in their daily practices to communicate to every patient scientific information on the present status of preventive measures for dental diseases and on the recommended procedures for maintaining the highest level of personal dental health.

REORGANIZING TRUSTEE DISTRICTS

The House directed that studies be made of the geographic and other factors involved in a revision of the present trustee districts, and that such studies be reported to the House at the 1954 annual session.

The president of the Association was authorized to appoint a special committee of three to five members, geographically selected, to conduct the study.

OASI REJECTED

By a vote of 312-64, the House of Delegates, in effect, again rejected the inclusion of the dental profession in the Old Age and Survivors' Insurance Provisions of the Social Security Act. The resolution passed by the House directed the Council on Legislation to present to Congress the Association's policy of opposing the inclusion of dentists in the OASI program.

As legislation to effect the inclusion of dentists was recommended by President Eisenhower in a recent message to Congress, the Council was authorized to await the appearance of this legislation before deciding whether to present suitable amendments in conformity with Association policy.

MOTION PICTURES, TV PROGRAMS DETRIMENTAL TO DENTISTRY

The resolution condemning motion picture and television programs detrimental to the profession of dentistry, submitted by the Michigan State Dental Association, was adopted by the House with an additional clause discouraging the impersonation of dentists by television actors in their advertising of commercial merchandise.

COUNCIL MEMBERS

The House elected the following Council members:

Constitution and Bylaws:
E. B. Penn, Florida, 1956
F. A. Pierson, Nebraska, 1956

Dental Education:
Bert L. Hooper, Nebraska, representing the American Association of Dental Schools, 1956
B M. Tylicki, California, representing the American Association of Dental Examiners, 1956
Harold W. Oppice, Illinois, the American Dental Association, 1956

Dental Health:
Robert Downs, Colorado, 1956
R. F. D. Johnson, Minnesota, 1956
Ernest Nuttall, Maryland, 1956
G. R. Brooks, Michigan, 1954

Registry of Dental and Oral Pathology:
Carl H. Boyden, South Dakota, 1956
Ned Williams, Pennsylvania, 1956

Dental Research:
J. Roy Blayney, Illinois, 1956
Alfred Asgis, New York, 1956

Dental Therapeutics:
David Weisberger, Massachusetts, 1956
C. E. Chamberlain, Illinois, 1956
Holmes T. Knighton, Virginia, 1956
Edward F. Mimmack, New York, 1954

Dental Trade and Laboratory Relations:
John Steen, California, 1956
J. Fred Folley, New York, 1956

Federal Dental Services:
Marvin E. Chapin, North Carolina, 1956
E. Jeff Justis, Tennessee, 1956

Hospital Dental Service:
Herman Elder, Pennsylvania, 1956
Bernard Wakefield, New York, 1956

Insurance:
C. E. Peterson, Connecticut, 1956
W. F. Huber, Wisconsin, 1956

International Relations:
John A. O'Keefe, District of Columbia, 1956
LeRoy M. Ennis, Pennsylvania, 1956

Journalism:
W. L. Barnum, Oregon, 1956
Paul E. Bomberger, Pennsylvania, 1956

Judicial Council:
H. B. McCarthy, Texas, 1956
Wilbur P. McNulty, Indiana, 1956

Legislation:
Paul E. Jones, North Carolina, 1956
Ralph E. Creig, Ohio, 1956

Membership:
William Diessner, Minnesota, 1956
E. Brooks Drake, West Virginia, 1956

National Board of Dental Examiners:
Frank O. Alford, North Carolina, American Association of Dental Examiners, 1956
George S. Easton, Iowa, American Association of Dental Schools, 1956
William Dickson, Minnesota, American Dental Association, 1956

Relief:
Eugene Pessagno, Jr., Maryland, 1956
Joseph Martin, New York, 1956

Scientific Session:
Walter Monia, Southern California, 1956
Donald R. Mackay, Minnesota, 1956

FEDERAL DENTAL SERVICES

The Association went on record as opposed to any plan imposing upon the federal government the obligation of providing for the dental rehabilitation of Selective Service registrants prior to their induction into the Armed Forces.

Resolutions asking for a six months' advance notice to dentists who are potential inductees and for preinduction and postservice dental care for members of the Armed Forces were rejected.

The continuation of the subcommittee on civil defense was authorized until the 1954 annual session, and members of the dental profession were urged to prepare themselves for civil defense functions both independently and through first-aid courses sponsored by their constituent societies.

GROUP HEALTH AND ACCIDENT INSURANCE PLAN

A resolution calling for the inclusion of all impaired risks in the Association's Group Health and Accident Insurance Policy was rejected. The resolution would have required the Board of Trustees to discontinue the entire plan if all Association members who had applied for the insurance were not accepted.

A resolution of the Washington State Dental Association, calling for a study of the complaints of policy holders, was transmitted to the Trustee of the Health and Accident Insurance Program for report at the next session of the Board of Trustees.

Regional administration of the group program "wherever and whenever expedient" was urged by the House on the recommendation of the reference committee on insurance.

H. Trendley Dean (left), secretary of the Council on Dental Research and a leading authority on the fluoridation of community water supplies, was presented the distinguished service award of the American Association of Public Health Dentists at the organization's meeting September 27 in Cleveland. Shown with Dr. Dean are Philip Blackerby of Battle Creek, Mich., chairman of the awards committee, and Carl Sebelius of Nashville, Tenn., retiring president of the Public Health Dentists, who made the presentation.

The October issue of The Journal mistakenly reported this award as a feature of the American Public Health Association's November meeting.

FLUORIDATION

The Association reiterated its recommendation that all local communities adjust the fluoride content of their public water supplies to the level recommended by responsible state and local health authorities.

Recalling that in 1950 the Association had recommended fluoridation as a safe and effective procedure for reducing the incidence of dental caries, the resolution noted the continuing evaluation of available evidence and the additional scientific findings which have substantiated the effectiveness and safety of fluoridation under properly controlled conditions.

Promoting Fluoridation • The House urged dentists in the United States to provide "informed leadership" as consultants to citizen groups and community officials seeking fluoridation facts.

The responsibility of individual dentists was delineated in the House-approved statement "The Role of the Dental Profession and Official Health Agencies in the Fluoridation of Public Water Supplies," which was submitted by the Council on Dental Health for approval as a guide to local dental societies and health agencies.

The statement defines "informed leadership" in the following words:

> The provision of this leadership involves informing the members of the dental profession on the dental and public health aspects of fluoridation; informing the public, generally, of the need for the measure in the prevention of dental caries; interpreting to individuals, community groups and civic officials the scientific data that have established the safety and efficacy of the measure, and participating in a technical advisory capacity in organized community efforts to obtain adoption of the measure.

PUBLIC HEALTH

Dental Prepayment Plans • "Principles for Determining the Acceptability of Dental Prepayment Plans," a statement formulated by the Council on Dental Health, was adopted with amendments by the House of Delegates.

The nine-point statement stresses that the advice of authorized representatives of the local or state dental society should be sought; the dentist should have complete freedom and responsibility in recommending treatment; the patient must have freedom to choose his dentist; payments should be made directly to the dentist; fees should be determined by authorized representatives of the dentists concerned, and all benefits and conditions should be explicitly stated in the plan.

Welfare Health Programs • Ten principles formulated by the Council on Dental Health were approved by the House as a guide to local welfare agencies in their programs to provide dental services. The principles include the following:

Dental services provided as part of a welfare health program should be under the immediate supervision of a qualified dentist.

Prevention and education measures for the community should receive primary emphasis.

Eligibility for services at public expense should be related to ability to pay.

Payments to participating dentists should be determined by authorized representatives of these dentists.

Advice of official representatives of the dental profession should be sought on technical and professional matters.

When possible, the welfare patient should have the opportunity to select a dentist of his own choice.

DENTAL EDUCATION

The House of Delegates recorded its conviction "that the postgraduate dental education programs such as hospital internships and residency programs for the dentist are vital and important for the training of diplomates of the dental specialty boards, for the training of research workers in the field of dentistry and for supplying dental school teachers."

The statement of support for these educational programs was called for in an attempt to gain for dental internship and residency programs recognition by Selective Service and the Veterans Administration comparable to the recognition given medical internship and residency programs.

Federal Dental Schools • The federal government should not establish undergraduate professional schools which would lead to the granting of dental degrees, the House stated. The Association will thus oppose the creation of any proposed United States Medical and Dental School which would grant any dental degrees. However, the scholarship plan of the Armed Forces for the procurement of regular dental corps officers was approved by the delegates "for this interim period of emergency."

Regional Plans • The House approved the principle of utilizing individual dental schools or groups of such schools to serve the education needs of an entire region.

Approval was given to the practice of "creating regional plans under which new dental educational programs may be justified on the basis of serving the residents of several states which do not have dental schools . . ." As many states cannot justify the establishment of a professional school to serve only its own group of potential students, the establishment of regional commissions for professional education, it is hoped, will result in the cooperative use and support of new and expanded regional education facilities.

Puerto Rican Students • To alleviate the shortage of dental education facilities in Puerto Rico, the House urged the dental schools of the United States to admit with advanced standing until 1958 the Puerto Rican graduates of foreign dental schools and those who are now enrolled as students in these schools, so that they may obtain a United States dental degree as required for licensure in Puerto Rico.

Dental Internships • Revised "Requirements for Approval of Hospital Dental Internships and Residencies" were approved by the House, after the Council on Dental Education had submitted the statement with the modifications recently suggested by the Special Committee on Problems in the Field of Oral Surgery.

The statement defines the types of internships recognized by the Council, the fundamental educational purpose of such internships and the type of training to be included in the year of internship.

The granting of academic degrees at the graduate level of master or doctor should continue to be limited to recognized universities or other academic institutions, the House of Delegates recommended.

Other Matters • A revised definition of a dental specialty was adopted and the course topic of roentgenology was added to the list of courses required in the curriculum of accredited schools for dental hygienists.

COMMEMORATIVE POSTAGE STAMP

The Association was instructed to petition the United States Post Office Department "to issue a special stamp during 1959 in commemoration of the 100th anniversary of the founding of the Association." This resolution was submitted by the New Jersey State Dental Society.

CONSTITUTION AND BYLAWS

Changes in the Constitution and Bylaws authorized by the House include the following:

Reference committees are to be named 60 days in advance of the annual session.

The Council on Constitution and Bylaws shall serve as the reference committee on Constitution and Bylaws of the House.

Dues for student members of the Association are to be $3.50 annually, instead of $3.00, in order to meet postal regulations for the second-class mailing of THE JOURNAL.

The Texas Dental Association is the new official name of the constituent society heretofore referred to in the Bylaws as the Texas State Dental Society.

The former Alaska Territorial Dental Society will hereafter be referred to in the Bylaws as the Alaska Dental Society.

The Council heretofore known as the Council on Dental Museum and Registry will hereafter be known as the Council on Registry of Dental and Oral Pathology.

The scientific section heretofore known as the Section on Practice Management will hereafter be known as the Section on Practice Administration.

1954 BUDGET

A total of $1,843,575 was appropriated from an estimated income of $1,951,000 for 1954. Sources of income are membership dues, advertising and subscription receipts, earnings on investments, exhibit space rentals, fee payments to the Division of Educational Measurements of the Council on Dental Education and to the National Board of Dental Examiners.

Expenses for the coming year include administration, annual session, Bureaus, Councils and Divisions, publication costs and a contingent fund.

Relief Fund Costs • Included in the budget for next year is the total expense of administering the Relief Fund. The House overwhelmingly approved a Board of Trustees suggestion that the cost of operating the Relief Fund be absorbed by the Association budget.

OTHER ACTIONS

The Council on Legislation was instructed to "postpone efforts to achieve enactment of the Army Dental Bill until there is a distinct probability that Congress will take appropriate action upon the legislation."

The Council on Dental Trade and Laboratory Relations was instructed to conduct a study of various accreditation plans proposed by constituent societies and state-wide laboratory groups.

Amendments to the *Standards for Constituent Dental Society Publications* adopted by the House emphasize the need for attractive journals "in keeping with high professional ideals," the advisability of appointing a rotating advisory committee to assist the society's editor and the wisdom of continuing the appointment of an editor whose abilities have proved satisfactory.

Advertising and Exhibit Standards of the American Dental Association, previously approved by the Board of Trustees (see April issue, p. 463), were adopted by the House with one amendment, referring to the prohibition of the use of dental or medical degrees in connection with commercial products. The amendment reads, "except that this restriction shall not apply to textbooks and other printed material produced for professional purposes."

The revised "Basic Standards for a Hospital Dental Service" of the Council on Hospital Dental Service was approved by the House of Delegates with amendments which had been added by the Special Committee on Problems in the Field of Oral Surgery in conference with the Council.

GENERAL MEETING AND OTHER EVENTS

"Unless the financial status of dental schools is improved, the problem will have grave consequences for the quality and quantity of dental service in the future. More adequate support of dental schools seems clearly indicated to forestall any deterioration in dental education."

The challenge presented by this crisis keynoted the address of Nelson A. Rockefeller, undersecretary of Health, Education and Welfare, at the general meeting of the annual session September 29.

"Potential sources for these funds, which need more exploration, are gifts from individuals and foundations and industry. . . . I believe that industry, generally, can and will assume an even greater share of this responsibility," Mr. Rockefeller stated. "Members of the dental profession themselves, in the interests of good citizenship and the advancement of their high calling, can do much to enlarge the support of dental schools from all these sources."

The need for expanded dental research is also a challenge to the dental profession, Mr. Rockefeller said. "Knowing the seriousness of dental disease and its costly impairments to health, the profession must seek to stimulate new interest . . . in the problems of dental health. There are many avenues for research which hold great promise that can and should be explored."

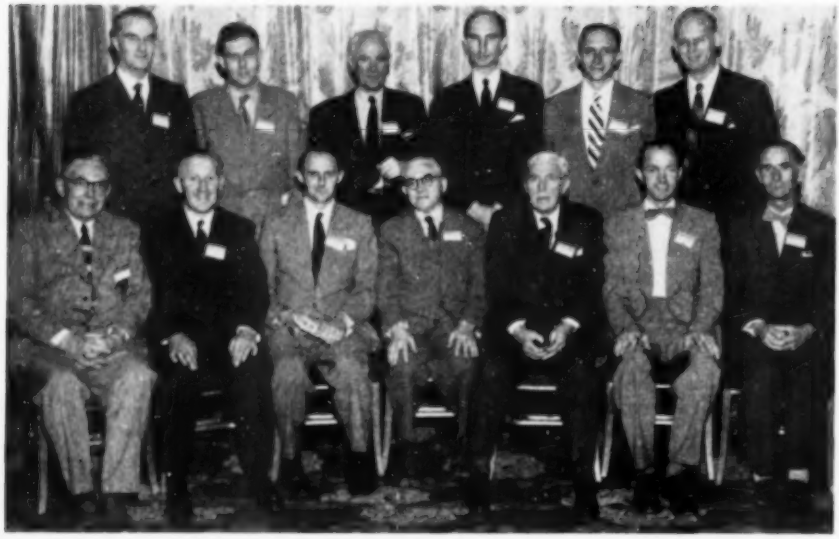
To make available to all people the best possible dental care, the aggressive support and participation of the community are essential, he concluded. Only teamwork between the local government, the local dental society, the practicing dentist and local civic enterprise, as well as the federal government, can bring about the ideal of dental care for all.

The general meeting was addressed also by Otto W. Brandhorst, president of the Association, who heralded the era of disease prevention in dental science. Dr. Brandhorst urged greater interest in promoting dental advances and the latest preventive measures, such as fluoridation.

The featured addresses of the meeting were preceded by a symphonic hour by the Cleveland Little Symphony. Guests at the meeting included Cleveland health officials and international guests, as well as officers and trustees of the Association.

PRESIDENT'S BANQUET

More than 1,000 persons attended the formal banquet and entertainment program presented on the evening of September 30 in honor of retiring president Otto W. Brandhorst and Mrs. Brandhorst.



Some of the distinguished international guests who attended the Association's 94th annual session in Cleveland are shown with Oren A. Oliver of Nashville, Tenn., chairman of the Council on International Relations. Seated (l. to r.) are Dr. Oliver; John F. Owens of Dublin, Ireland, director of the conservation department at the Dublin Dental Hospital; G. E. M. Hallett of the Sutherland Dental School, University of Durham, England; Jose Font of Valencia, Spain; Ernest Charron, dean of the University of Montreal Faculty of Dental Surgery; Mervyn W. Evans of Adelaide, Australia, and Erik Husted of Copenhagen, dean of the State Dental School of Denmark.

Standing (l. to r.) are Don Gullett of Toronto, secretary of the Canadian Dental Association; G. Dekker of Bunnik, the Netherlands, professor at the University of Utrecht; S. Bryhn Ingebrigtsen, chief of the school dental services in Norway; Leonardo James of Buenos Aires, delegate of the Ministry of Health of Argentina; Josse De Wever of Antwerp, Belgium, and Knut Gard of Oslo, secretary-general of the Norwegian Dental Association.

The event was held in the Ball Room of the Hotel Statler, on the eve of the completion of Dr. Brandhorst's term. Walter J. Pryor, chairman of the local arrangements committee, presided.

GUEST SPEAKERS

Howard Rusk, chairman of the Health Resources Advisory Committee of the Office of Defense Mobilization, predicted that "beginning in the late summer of 1954, we can expect a substantial call both for physicians and dentists," in his speech before the House of Delegates October 1.

"The graduates of 1954 who will be available for service (that is, who will be classified in Priority III and will be physically qualified) will probably number less than 1,500. The real brunt of the 1954 call will fall on dentists in Priority III who are over 40 years old," Dr. Rusk stated.

Although the increasing number of graduates of dental schools will help the military services, it may not increase the supply of civilian dentists, he commented. "For the civilian population the situation will be, if anything, more difficult since an increasing proportion of civilian service must come from the older men, who,

in general, do not carry as heavy patient loads."

For a full text of Dr. Rusk's address, see page 501 of this issue of THE JOURNAL.

Guest speakers who addressed the opening meeting of the House of Delegates included Julian Price of Florence, S. C., trustee of the American Medical Association; Gustave Ratte of Quebec, president of the Canadian Dental Association; Mervyn W. Evans of Adelaide, Australia, representing the Australian Dental Association; Knut Gard of Oslo, secretary-general of the Norwegian Dental Association; G. E. M. Hallett of the Sutherland Dental School, Newcastle-upon-Tyne, England; John F. Owens, director of the conservation department, Dublin Dental Hospital, Dublin, Ireland, and Oren A. Oliver of Nashville, Tenn., president of the Fédération Dentaire Internationale.

Guests who addressed other meetings of the House were Rep. George S. Long of Louisiana, dentist and member of the U. S. House of Representatives; Ernest Charron, dean of the University of Montreal, Canada; Erik Husted, dean of the State Dental School, Copenhagen, Denmark; Gerritt Dekker, assistant professor at the University of Utrecht, The Netherlands; S. Bryhn Ingebrigtsen, chief of school dental services of Norway; L. Vianna, representing the Brazilian Dental Society; Michel Khoury, professor of the Syrian University Dental School, Damascus, Syria, and Leonard James, representing the Ministry of Health of Argentina.

INSTALLATION CEREMONIES

The gavel of the Association presidency was presented to Leslie M. FitzGerald of Dubuque, Iowa, incoming president, by Otto W. Brandhorst of St. Louis, retiring president, at the closing session of the House of Delegates October 1. Other new officers were also introduced to the House.

Dr. FitzGerald, in the first action of his administration, presented to Dr. Brandhorst in the name of the Association a testimonial to distinguished service. Dr. Brandhorst also received a past president's pin from Oren A. Oliver of Nashville, Tenn., representing the Past President's Club.

ACTIONS OF THE BOARD OF TRUSTEES

APPOINTMENTS

In its report September 28 to the House of Delegates, the Board of Trustees announced that H. B. Washburn of St. Paul had been reappointed to the office of treasurer of the Association for a one-year term, and that Lon W. Morrey of Chicago had been reappointed to the office of editor for a three-year term.

Council Chairmen • Four new Council chairmen were appointed by the incoming Board of Trustees after the House of Delegates had elected Council members. The new chairmen and their Councils include:

B. M. Tylicki of Long Beach, Calif., Council on Dental Education;

C. E. Peterson of Rockville, Conn., Insurance;

Frank O. Alford of Charlotte, N. C., National Board of Dental Examiners;

Charles Patton of Philadelphia, Scientific Session.

Other Council chairmen were reappointed.

Committee on Local Arrangements, 1954 Session • On the recommendation of the Florida State Dental Association and Curtis A. Haggard, previously appointed chairman of the Committee, the following Miami dentists were appointed to the Committee on Local Arrangements for the 1954 annual session in Miami:

Robert A. Thoburn, T. A. Price, A. E. Rosenthal, L. S. Turner, J. L. Armstrong, E. B. Penn, H. R. Turner, J. E. Edwards, Horace L. Cartee, S. H. Gordon, George J. Coleman, H. W. Stubbs, Mrs. Curtis A. Haggard and R. J. Smith.

The Board also approved the appointment of Roy Bourgoyne of Memphis, Tenn., as vice-chairman of the section on oral surgery and anesthesiology for the 1954 annual session.

Chairman, Local Arrangements, 1955 Session • William B. Ryder, Jr., of San Francisco was appointed chairman of the General Committee on Local Arrangements for the 1955 annual session.

Atlantic City Session, 1956 • October 1-4, 1956, will be the dates of the 97th annual session of the Association, the Board announced after its October 1 meeting.

National Health Council • The representatives of the Association to the meetings of the National Health Council will be Percy T. Phillips of New York, Daniel F. Lynch of Washington, D. C., and Charles H. Patton of Philadelphia. They were chosen by the Board during its meeting October 1 after the adjournment of the House of Delegates.

Inter-Association Committee on Health • At the same meeting, the following representatives were elected to represent the Association in meetings of the Inter-Association Committee on Health: Leslie M. FitzGerald of Dubuque, Iowa; Percy T. Phillips of New York; Kenneth A. Easlick of Ann Arbor, voting members, and Harold Hillenbrand of Chicago, staff representative.

Fédération Dentaire Internationale • The Board appointed Harold Hillenbrand, secretary, to the position of chairman of the delegation to the 1954 meeting of the F.D.I. in The Hague. Other delegates will be named before the meeting, which is to be held June 1-5.

Special Committee on Problems in the Field of Oral Surgery • The Board retained the personnel of the present committee, but appointed Leslie M. FitzGerald, president of the Association, to act as chairman, and added Daniel F. Lynch, president-elect, to the committee.

Subcommittee on Civil Defense • After receiving the resignation of David E. Hunn, chairman of the subcommittee on civil defense, the Board appointed John R. Abel of Beverly Hills, Calif., chairman, and John G. Carr of Camden, N. J., a member of the subcommittee. Lloyd Rogers of Detroit continues to serve on this committee.

JOURNAL OF ORAL SURGERY

The Board approved the reappointment of three members of the editorial staff of the *Journal of Oral Surgery*. Three-year terms were given James R. Cameron of Philadelphia, Leslie M. FitzGerald of Dubuque, Iowa, and Lon W. Morrey of Chicago, whose current terms expire in December.

SURVEY OF DENTISTRY

The W. K. Kellogg Foundation has agreed to underwrite for $250,000 the proposed comprehensive two-year "Survey of Dentistry." To assure the impartiality of the survey, the Association's Board has obtained a commitment from the American Council on Education to conduct the survey.

The Association's officers and trustees, who met in conjunction with the 94th annual session, included (seated, l. to r.): Percy T. Phillips of New York; H. B. Washburn of St. Paul; F. A. Pierson of Lincoln, Neb.; Leslie M. FitzGerald of Dubuque, Iowa, incoming president; Otto W. Brandhorst of St Louis, retiring president; Henry F. Westhoff of St. Louis; John A. O'Keefe of Washington, D. C.; Walter J. Pryor of Cleveland; Harold Hillenbrand of Chicago; Charles I. Taggart of Burlington, Vt.

Standing (l. to r.) are Arthur F. Schopper of Kansas City, Mo.; C. Willard Camalier of Washington, D. C.; Bernerd C. Kingsbury of San Francisco; James E. John of Roanoke, Va.; C. S. Renouard of Butte, Mont.; Obed H. Moen of Watertown, Wis.; W. R. Alstadt of Little Rock, Ark.; L. H. Jacob of Peoria, Ill.; Lon W. Morrey of Chicago; Earl G. Jones of Columbus, Ohio; Charles Patton of Philadelphia; Daniel F. Lynch, Washington, D. C.; and Lewis W. Thom of Minneapolis. Harry Lyons of Richmond, Va., speaker of the House of Delegates, was absent when this photograph was taken.

W. Earle Craig of Pittsburgh, who died October 6, had been elected to his second term as trustee from the Third District. He was a past president of his state dental society and a former member of the Association's nomenclature committee. He served as president, treasurer and (for 25 years) as secretary of the Odontological Society of Western Pennsylvania. See obituary, page 588.

Edward R. White of Jersey City, trustee from the Fourth District, was chairman of the local arrangements committee for the 1950 annual session in Atlantic City and has been a first vice-president of the A.D.A., member of the Council on Legislation and president of the New Jersey State Dental Society, Hudson County Dental Society and Columbia alumni organization.

Howard B. Higgins of Spartanburg, S. C., trustee from the Fifth District, is a past president of his state's Board of Dental Examiners. A member of the House of Delegates for 15 years, he has been second vice-president of the Association (1943-44), president, secretary and treasurer of the Spartanburg Dental Society and secretary of the South Carolina Dental Association.

L. H. Jacob of Peoria, Ill., has been the trustee from the Eighth District since 1949, after serving as secretary of the Council on Relief and a member of the membership committee. A dentist for 38 years, Dr. Jacob served as secretary of the Illinois State Dental Society for nine years, during 1939-47. He has been a member of the Peoria City Health Board for five years.

Paul H. Jeserich of Ann Arbor, trustee from the Ninth District, is dean of the University of Michigan School of Dentistry and director of the W. K. Kellogg Foundation Institute. He has served on the Council on Dental Therapeutics, Judicial Council and International Relations Committee. He is a past president of the Michigan State Dental Society.

The Kellogg Foundation grant represents one-half of the total estimated cost of the survey. "Additional sources of support will be sought in the coming months, and there is good reason to believe that they will be found," the Board report stated.

HISTORY OF THE ASSOCIATION

The Board instructed the editor of the Association to continue as chairman of the committee selected to develop a history of the Association. The editor's report noted that of the several universities approached Loyola University of Chicago had submitted the most favorable proposals for the preparation of the history.

According to the University's prospectus, the project would require about three calendar years to complete in manuscript stage.

OTHER ACTIONS

A special committee was appointed to develop a program for the observance of the Association's centennial year in 1959, and another special committee was named to study ways and means of improving the Association's scientific program.

The Board's committee on Association headquarters building was continued for one year, with instructions to conduct further negotiations for new or expanded headquarters.

The editor was authorized to continue investigating the proposed publication of a journal devoted exclusively to abstracts of dental articles. The editor is to report his findings at the spring meeting of the Board.

The Board expressed its appreciation "to all the constituent societies which this year, for the first time, enabled the American Dental Association Relief Fund to attain its goal of $100,000."

The next meeting of the Board will be held March 18-20, 1954.

National Defense

NEW REGULATIONS ISSUED ON PROFESSIONAL DRAFT

The October 8 directive of the Department of Defense implementing the provisions of the special draft law, Public Law 84, provides for the commissioning of special registrants who are also liable to the regular draft, the promotion of certain officers and the call up of dental officers in Reserve and National Guard units.

Among the provisions of the directive, as analyzed by the Council on Federal Dental Services, are the following:

Dual Liability • A special registrant who is also a regular registrant may, if declared available and acceptable by Selective Service, apply for a commission in the service of his choice. The registrant's acceptance for commission in the service he chooses will, however, be subject to the actual needs of that service.

The Department of the Army will allocate those registrants with dual liability according to quotas established by the Assistant Secretary of Defense (Manpower and Personnel) in collaboration with the Assistant Secretary of Defense (Health and Medical).

Adequate Notice • The new regulations specify that registrants will be called to duty between 45 and 60 days following their induction dates. As each special registrant is notified 30 days beforehand of his induction date, this new regulation should assure an adequate preparation period between notice and call to active duty.

Order of Call Up • Dental reservists will be ordered to active duty at approximately the time they would be ordered for induction if they were special registrants. Dentists who joined National Guard units after June 25, 1950, will be ordered to

active duty in accordance with the established priorities.

Policies Continued • The directive continues the lowered physical standards for dentists which were adopted by the Armed Forces early in 1953. It also continues the policy of inducting as enlisted men those registrants who are found ineligible for a commission or who refuse to apply for a commission. Although a qualified registrant who elects to be inducted may later apply for a commission, he will lose his right to $100 monthly equalization pay.

Commission Rank • The commissioned grade to which a dental special registrant will be appointed is to be commensurate with professional education, experience or ability; it is to be based on the number of years spent in appropriate professional activities between the date of graduation from dental school and the date of appointment.

The established "cut off" dates for determining years of professional experience (December 6, 1950, for Priority I and II special registrants and July 1, 1952, for Priority III special registrants) seem to be ruled out.

Physicians and dentists with less than four years of professional experience will be appointed to the grade of first lieutenant in the Army and Air Force or lieutenant (j.g.) in the Navy.

Those with four or more years but less than 11 will be appointed captain in the Army or Air Force or lieutenant in the Navy.

Those with 11 or more but less than 18 years will be appointed major in the Army or Air Force or lieutenant commander in the Navy.

Those with 18 or more years will be appointed lieutenant colonel in the Army and Air Force or commander in the Navy.

These criteria for determining grade will be used also for the current appointment of Reserves on inactive duty who are recalled to active duty.

Veterans Administration

NEW VA REGULATIONS LIMIT ELIGIBILITY, "REPEAT" CARE

New regulations on outpatient dental care were issued by the Veterans Administration in mid-October, establishing seven classes of eligible veterans and clarifying the benefits accruing to each.

Veterans in five of the eligible classifications must establish service-connection for the dental defects concerned. Only those veterans residing in old soldiers' homes and those deemed to be in need of dental treatment as an adjunct of other VA medical treatment are not required to establish service-connection in order to obtain VA authorization.

Repeat treatment will not be authorized for those persons with service-connected dental disabilities which are less than 10 per cent disabling (Class II). Persons in this class are entitled only to completion of the dental treatment indicated as service-connected, the regulations state; repeat treatment will be given only if the work previously performed was not "within good professional standards."

The classifications of eligible veterans are as follows:

Class I • Those persons who have a dental condition which of itself creates a physical disability of 10 per cent or more.

Against a background of the House of Delegates in session are: (upper left) the new vice-presidents of the Association, (seated) Charles A. Pankow of Buffalo, second vice-president, and Walter J. Pryor of Cleveland, first vice-president; (standing) Hollis O. Warrick of Enid, Okla., third vice-president. Center: Leslie M. FitzGerald addresses the House after assuming the presidency of the Association. Lower left: Dr. FitzGerald presents to retiring president Otto W. Brandhorst a testimonial from the American Dental Association.

Upper right: Oren A. Oliver, president of the Fédération Dentaire Internationale and a past president of the Association, congratulates immediate past president Otto W. Brandhorst after presenting him with a past president's pin. Lower right: Howard A. Rusk, chairman of the Health Resources Advisory Committee, addresses the closing session of the House of Delegates. Dr. Rusk introduced the members of his committee and spoke to the House on the latest data regarding military needs for dental officers. For a full text of his address, see page 501.

Persons in this class are entitled to dental examination at any time and to such dental treatment as may be needed to correct any conditions directly relating to the injury.

Class II • Those persons with service-connected disability arising from dental causes where the disability is less than 10 per cent disabling.

These veterans are not entitled to a dental examination until an adjudication of service-connection has been made, unless such an examination is needed to adjudicate the claim.

Veterans in this class are entitled to completion of the dental treatment indicated as service-connected. They are not entitled to repeat treatment if the work performed was within good professional standards.

Class III • Those veterans deemed to be in need of adjunct dental treatment on account of a service-connected systemic disorder.

Both dental examination and dental treatment on either an inpatient or an outpatient basis will be authorized when deemed necessary by the physician and dentist in charge of the case.

Class IV • Residents of old soldiers' homes (domiciliary facilities).

Such persons receive routine maintenance care on an inpatient basis.

Class V • Beneficiaries pursuing a course of vocational training under authorization of existing law, subject to the limiting provisions of the 1954 Appropriations Act which requires establishment of service-connection for the specific dental disability.

Such persons are entitled to any dental care on an outpatient basis as may be necessary to prevent the interruption of their training.

Class VI • Spanish-American War veterans.

By basic law Spanish-American War veterans are entitled to complete dental treatment on either an inpatient or an outpatient basis. Until next July, however, the limiting provisions of the current Appropriations Act will require even such beneficiaries to establish specific service-connection for dental disabilities.

Class VII • Korean War veterans who are entitled to examination and treatment on the basis set forth in Class II.

Association Affairs

RELIEF FUND DRIVE OPENS WITH $100,000 GOAL

The annual Relief Fund campaign of the American Dental Association has opened formally with the distribution of the traditional Relief Fund Seals to members of the dental profession throughout the United States.

A goal of $100,000 has been set as the amount to be sought from members of the 59 participating state and territorial societies and federal agencies. Last year a total of $103,461.89 was contributed; 36 constituent societies reached or exceeded their respective goals. Alaska and Alabama more than doubled their quotas.

During the 1953-54 campaign, state-by-state contribution totals will be reported in two separate listings: those from state societies with goals over $900 and those with goals of $900 or less.

"We believe that this new method of reporting contributions will keep the various constituent societies more readily informed of the progress of the campaign among the larger and smaller societies," Leo W. Kremer, chairman of the Council on Relief, stated.

Contributions should be sent to: American Dental Association Relief Fund, 222 East Superior Street, Chicago. Each donation will be recorded and one-half of the amount will be returned to the Relief Fund of the state society of the contributor.

W. P. PHAIR NAMED SECRETARY OF DENTAL HEALTH COUNCIL

The appointment of W. Philip Phair to the position of secretary of the Council on Dental Health was announced during the 94th annual session by Harold Hillenbrand, secretary of the Association.

W. P. Phair

Dr. Phair, for the past three years assistant secretary of the Council, succeeds Allen O. Gruebbel, who resigned June 1. A graduate of the University of Iowa College of Dentistry, Dr. Phair earned a master's degree in public health at the University of Michigan. Prior to his appointment to the Central Office staff, he was head of the dental hygiene section of the Washington State Health Department.

Dental Societies

COLOR TV TO HIGHLIGHT GREATER NEW YORK MEETING

Color television programs again will highlight the annual Greater New York Dental Meeting, to be held December 7-11 at the Hotel Statler, New York, it has been announced by Arthur E. Corby, general chairman.

Table clinics will be presented by television December 7 in two-hour morning and afternoon programs. Surgical demonstrations will be presented December 10 and 11 by ten practitioners who will work with patients before the television camera.

Two giant screen (4½ ft. x 6 ft.) receivers will enable an audience of about 1,000 to view the programs while seated in a viewing theater. The programs will be televised and sponsored by Smith, Kline and French Laboratories.

In addition to the television programs, a series of 42 registered clinics will be presented during the meeting, as well as a symposium on cigarettes by four medical scientists; round table discussions; an exposition on the electron microscope and a symposium on mouth rehabilitation and hydrocolloids.

MID-CONTINENT CONGRESS TO BE HELD NOVEMBER 16-18

A feature of the St. Louis Dental Society's Mid-Continent Dental Congress, to be held November 16-18 in St. Louis, will be a four-hour course on practice administration by Miss G. Archanna Morrison of West Roxbury, Mass. Miss Morrison, who has conducted more than 450 courses on this subject, is the author of the book, *In the Dentist's Office.*

Essayists featured on the program of the Congress include: Edward L. Ball of Cincinnati; Louis I. Grossman of Philadelphia; E. R. Granger of Mt. Vernon,

At the annual Conference of State Society Officers, which was held September 27 in Cleveland, these men were chosen to head the organization for 1953-54. They are (l. to r.) Edgar L. Bessette of Cranston, R. I., secretary; Jack Allen Rice of Coeur d'Alene, Idaho, vice-president, and Bernard N. Walker of Charlotte, N. C., president.

An account of the Conference will appear in the December issue of The Journal, together with stories on the fourth annual Dental Health Conference and the meetings of associated groups.

N. Y.; Rex Ingraham of Hollywood, Calif.; Ralph Boos and Ralph G. Peterson of Minneapolis; LeRoy E. Kurth of Chicago and Jerome S. Grosby of St. Louis.

Programs of the Congress may be obtained by writing to the St. Louis Dental Society, 8013 Maryland Ave., St. Louis 5.

NEW YORK STATE SOCIETY'S PRESIDENT DIES

Leo W. Roohan of Saratoga Springs, N. Y., president of the Dental Society of the State of New York, died October 4 at the age of 58. He had just returned from the annual session of the American Dental Association, where he served as a delegate.

A graduate of the University of Pennsylvania School of Dentistry in 1917, Dr. Roohan served in the Army Dental Corps in World War I. He was the founder and first president of the Saratoga County Dental Society; he had been president also of the Fourth District Dental Society of New York, serving since that time on the Society's executive committee and Board of Governors.

Dr. Roohan was a member of the medical staff of Saratoga Hospital and was chairman of the City Planning Board. The remainder of his term, which was to expire in May, will be filled by John T. Flynn of Scarsdale, N. Y., vice-president.

Dental Education

NORTHWESTERN DENTAL SCHOOL NAMES ASSISTANT DEAN

Clarence M. Peebles, former director of admissions and student personnel at Northwestern University Dental School, has been appointed assistant dean.

Dr. Peebles has served also as assistant professor of psychology at the Dental School since 1946, when he received his doctorate in education from the University.

COLUMBIA HONORS PROFESSORS EMERITUS OF DENTISTRY

Two professors emeritus of dentistry at Columbia University, Charles F. Bodecker and Henry S. Dunning, were among the 25 individuals who received distinguished service awards October 13 at the twenty-fifth anniversary observance of Columbia-Presbyterian Medical Center, New York.

Dr. Bodecker, currently editor of the

New York State Dental Journal, is well known for his dental research. He retired from the University in 1946. Dr. Dunning, an oral surgeon, was one of the original founders of the School of Dental and Oral Surgery of Columbia University.

DENTAL SCHOOLS ANNOUNCE NEW POSTGRADUATE COURSES

Kansas City • Airbrasive technic will be taught December 19-23 by Carl Sawyer at the University of Kansas City School of Dentistry.

Information and registration may be obtained by writing to Joseph F. Jacobs, director of the postgraduate division, University of Kansas City School of Dentistry, Kansas City, Mo.

Loyola (Chicago) • A course on periodontology, under the direction of Balint Orban, will be presented January 21-23 at the Chicago College of Dental Surgery, Loyola University.

The three all-day sessions will include instructions in all phases of periodontics, including diagnosis, treatment, occlusal equilibration, surgery and home care. Dr. Orban will be assisted by F. M. Wentz and John A. Kollar.

Information may be obtained from the Chicago College of Dental Surgery, Loyola University, 1757 West Harrison Street, Chicago.

Pennsylvania • Three postgraduate courses to be presented by the University of Pennsylvania School of Dentistry during the next three months are:

Periodontal therapy, December 14-19; partial dentures, Mondays, November 16-December 21, and precision prosthesis and functional treatment, January 18-23.

A 108-page book which contains the 17 lectures and a summary of seminar proceedings of the School's recent World Conference on Endodontics is available in limited supply at $7 per copy. Checks may be made payable to Lester W. Burket, in care of the School.

Information on the courses and registration may be obtained by addressing postgraduate courses, School of Dentistry, University of Pennsylvania, Philadelphia 4.

Washington (Seattle) • A course in diagnosis and treatment planning in children's dentistry will be presented November 19-20 at the University of Washington School of Dentistry, Seattle.

Instructors include David B. Law, pedodontics; Alton W. Moore, orthodontics; F. L. Jacobson, oral diagnosis and treatment planning; James A. Carrell, speech correction, and John W. Neilson, periodontology.

Inquiries may be sent to the director of postgraduate dental education, School of Dentistry, University of Washington, Seattle 5.

International

TOUR TO 1954 F.D.I. MEETING IN HOLLAND ANNOUNCED

The 1954 meeting of the Fédération Dentaire Internationale, to be held June 10-17 at The Hague, The Netherlands, will be conducted simultaneously with the All-Holland Dental Anniversary of the Dutch Association for the Advancement of Dentistry (Nederlandsche Maatschappij tot Bevordering der Tandheelkunde).

A tour to the meeting will be conducted by C. W. Carrick of Oberlin, Ohio. Further information on the itinerary may be obtained by writing to Dr. Carrick, Oberlin Savings Bank Building, Oberlin, Ohio.

URUGUAY DENTAL ASSOCIATION TO HOLD SCIENTIFIC MEETING

The first Uruguayan Dental Days will be held November 24-28 in Montevideo, Uruguay, it has been announced by Rodolfo Gorriti, president of the Uruguay Dental Association.

Daily sessions will be held in the Clinical Hospital of Montevideo, Dr. Gorriti states, and evening meetings will take place in the headquarters of the Dental Association. Members of the American Dental Association have been invited by Dr. Gorriti to attend the meeting and to participate.

General

CLASSIFIED ADVERTISING RATE TO CHANGE IN JANUARY

A change of rates for classified advertising in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION will go into effect with the January, 1954, issue of THE JOURNAL. At the present time, classified advertisements are $3.50 plus 25 cents for a box number at the Association. Hereafter such advertisements will be $4.00 plus 10 cents for each additional word over 30 words.

PAN AMERICAN DENTAL GROUP TO MEET AT WALDORF-ASTORIA

The December 9 dinner meeting of the Pan American Odontological Association will be held at the Waldorf-Astoria Hotel, New York, rather than at the Statler Hotel, as previously announced.

Information on the event and the organization may be obtained from Ralph Howard Brodsky, president, 14 East 81st Street, New York.

"THE COMMON GOOD" SERVED BY FLUORIDATION, SAYS JUDGE

A sweeping decision favoring fluoridation was handed down October 22 by Judge Joseph A. Artl of the Common Pleas Court of Cleveland.

After studying 610 pages of testimony delivered since May in the suit of William Krause, Cleveland lawyer, to prevent the fluoridation of Cleveland drinking water, Judge Artl ruled that "a person's Constitutional right to treat his health as he deems best, and of parents to raise their children as they deem best and 'to be free from medical experimentation and to exercise freedom of religion' are all subordinate to the common good."

Further, Judge Artl ruled that the ordinance directing the fluoridation of Cleveland's drinking water did not violate federal, state or city laws, and that all actions of city officials in approving fluoridation were legal.

Judge Artl pointed out that the opinion of physicians, dentists and the public is "overwhelmingly in favor of fluoridation."

In his statement he also gave the opinion that "children's dental health is properly a province of community laws."

Mayor Thomas Burke announced that he is "delighted" with the decision and that he favors the immediate institution of fluoridation. Krause has announced that he will appeal the decision to a higher court.

SOCIETY FOR REHABILITATION TO MEET FEBRUARY 4-6

The National Association for Somatoprosthetics and Rehabilitation will hold its annual convention February 4-6 in Chicago, in conjunction with the Chicago Dental Society's Midwinter Meeting, it has been announced by A. C. Fonder, president of the organization.

The three-day program will stress the teamwork approach to rehabilitation, Dr. Fonder states. Scientific exhibits, limited attendance clinics, table clinics and motion pictures will be presented.

Further information may be obtained from Dr. Fonder, 907 San Angelo Boulevard, San Antonio, Texas.

CARIES RESEARCH ON ANIMALS TO BE REPORTED BY A.A.A.S.

A symposium on recent animal experimentations in caries research, to be presented on the morning of December 29, will be the principal presentation of the dental section when the American Association for the Advancement of Science meets December 26-31 in Boston.

The symposium wil linclude the following papers:

"Methods of Production and Evaluation of Experimental Animal Caries," by Paul H. Keyes of the Harvard School of Dental Medicine and Erling Johansen of the University of Rochester;

"Genetic Factors in Experimental Animal Caries," by H. R. Hunt and Carl A. Hoppert of Michigan State College;

"Developmental Factors in Experimental Animal Caries," by James H. Shaw and Reidar F. Sognnaes of Harvard School of Dental Medicine;

"Salivary Factors in Experimental Animal Caries," by David Weisberger and Abraham Schwartz of Harvard School of Dental Medicine;

"Oral Environmental Factors in Experimental Animal Caries," by Frank J. Orland of the University of Chicago and Sidney B. Finn of the University of Alabama School of Dentistry;

"Inhibitory Agents in Experimental Animal Caries," by John Hein of the University of Rochester and Robert Fitzgerald of the National Institute of Dental Research.

Other papers in the dental section will be presented December 29 also, during afternoon and evening sessions.

TESTIMONIAL DINNER HONORS LESLIE M. FITZGERALD

A testimonial dinner honoring Leslie M. FitzGerald of Dubuque, Iowa, new president of the American Dental Association was held October 5 by the Dubuque District Dental Society and the Dubuque County Dental Society.

Toastmaster was Henry M. Willits of Dubuque; speakers included J. Orton Goodsell of Saginaw, Mich., representing the American Board of Oral Surgery; C. S. Foster of Cedar Rapids, Iowa, former Association trustee; Herbert B. Bain of Chicago, director of the Association Bureau of Public Information and James E. Berney of Davenport, representing the Iowa State Dental Society.

Also . . . The dental director of the New Mexico Department of Public Health is now David F. Striffler, formerly director of the dental program in Dearborn (Mich.) public schools. . . . Frank I. Livingston, formerly dental director in Montana, is now director of the dental division of the State of New Hampshire, and the new dental health chief of the city of Philadelphia is Jacob M. Wisan, who has been chief of the research and education division, Veterans Administration Dental Service. . . . The second Herman L. Reiss Memorial Lecture will be presented by the New York Institute of Clinical Oral Pathology November 23 at the New York Academy of Medicine. Paul Klemperer, pathologist at New York's Mount Sinai Hospital, will speak on "The Anatomic Concept in Pathology." . . . Clifton O. Dummett of Tuskegee, Ala., has been appointed editor of the *Bulletin of the National Dental Association*. . . . The new executive director of the National Health Council is Philip E. Ryan, formerly an executive with the International Refugee Organization; he succeeds Thomas D. Dublin. . . . In Sweden, the city of Norrkoping is fluoridating part of its water system, with one-third of its 85,000 inhabitants presently receiving the 1 ppm of fluoride in their drinking water.

The Reader Comments

THE JOURNAL *devotes this section to comment by readers on topics of current interest to dentistry. The editor reserves the right to edit all communications to fit available space and requires that all letters be signed. Signatures will be deleted before publication at the request of the author. Printed communications do not necessarily reflect the opinion or official policy of the Association. Your participation in this section is invited.*

The Editor

SUGAR AND DENTAL CARIES

Your editorial in the August issue of THE JOURNAL entitled "Discrimination Against Candy Deplored by Confectioner" is the best I can remember reading. Maybe now that the Council on Dental Health and the Council on Dental Therapeutics have made their report on the relation of sweets to dental caries, more interest will be aroused among the membership of the American Dental Association. If this occurs, we should have at least two pages in THE JOURNAL each month on the subject of concentrated carbohydrates and their relation to poor mouth and general health.

Enclosed is a clipping which reads, "Sugar growers and refiners plan a $600,000 fund to promote the merits of sugar—being alarmed by the growing popularity of sugar-free canned food and drink."

After reading that, I felt that maybe the dental profession was doing some good educational work, after all. We should try to combat this plan of the sugar growers and refiners if at all possible.

Because of the harmful effects which sugar produces in the body, we have the responsibility of warning our patients about it.

J. Ross Pringle, D.D.S., Greensboro, N. C.

FLUORIDATION OPPOSED

"Methinks thou doth protest too much" any opposition to fluoridation. As men of some education we should be among the first to understand and welcome questions on this and all other controversial subjects. J. Roy Doty's article in the August issue of THE JOURNAL reduces the argument to personal sarcasm directed toward all who are not on the fluoridated water wagon.

In 1953 I am living in Sheboygan, Wis., a city that demonstrates the results of such clever (?) planning. Nothing against fluoridation gets into the local press; nothing has ever been said publicly by our health departments or dental or medical associations to show that they are really thinking on this subject except as a solid totalitarian mass.

I feel (don't scoff—these feelings have more often proved true than you would believe) that the addition of sodium fluoride to the drinking water of an entire city is undesirable. Dr. Doty must know, as well as I, that chlorination and pasteurization treat the product for its impurities, whereas fluoridation treats the patient by mail order without even seeing him or caring about his needs.

We have had fluoridated water in the city of Sheboygan for about seven years. It is lately that the mottled enamel is starting to show up; it is not pretty.

From where I stand, at the dental chair, this is all I can see. If it should happen that fluoride has an accumulative quality within the body then I am not seeing "the half of it." And I have not noticed that my child patients have fewer cavities, except as they may be contrasted to those of the malnourished and untreated children of depression periods.

Until I am more convinced, I shall continue to drink bottled spring water. This does not mean that more money should be spent to increase the sales campaign of the doctored product.

I am growing weary of this kind of thing, so that even in a town such as this where fluoridation is praised to high heaven, the expensive and inconvenient bottled water is being bought in increasing amounts.

Carlton F. Brehmer, Sheboygan, Wis.

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Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Fifth Annual Session	Nov. 8-11, 1954	Miami
Ninety-Sixth Annual Session	Oct. 17-20, 1955	San Francisco
Ninety-Seventh Annual Session		Atlantic City, N. J.

MEETINGS OF CONSTITUENT SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 25-27, 1954	Biloxi, Miss.	F. A. Finney, Jr.	1045 Forrest Ave., Gadsden
Alaska	June 20, 1954	Mt. McKinley National Park	C. J. Pearson	500 K St., Anchorage
Arizona	Apr. 21-24, 1954	Phoenix	E. M. Scott	17 E. Weldon Ave., Phoenix
Arkansas	Apr. 4-7, 1954	Little Rock	D. M. Hamm	Box 89, Clarksville
California	Apr. 26-28, 1954	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	May 3-5, 1954	Los Angeles	J. P. Bowers	124 W. Lime Ave., Monrovia
Colorado	Oct. 3-6, 1954	Colorado Springs	W. R. Humphrey	724 Republic Bldg., Denver
Connecticut	June 2-4, 1954	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 13, 1954	Wilmington	J. C. Baker	Mayfair Apts., Sec. C., 1300 Harrison St., Wilmington
District of Columbia	June 8, 1954	Washington	Z. B. Lloyd	2007 R St., N.W., Washington
Florida	Apr. 25-28, 1954	Daytona Beach	B. S. Carroll	706 Professional Bldg., Jacksonville
Georgia	Oct. 10-13, 1954	Atlanta	J. W. Yarbrough	Bibb Bldg., Macon
Hawaii		Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu 17
Idaho	Apr. 29, 30, 1954	Boise	C. G. Hanson	409 11th Ave., S., Nampa
Illinois	May 10-13, 1954	Springfield	P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 17-19, 1954	Indianapolis	E. E. Ewbank	Box 96, Kingman
Iowa	May 3-5, 1954	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 16-19, 1954	Wichita	F. A. Richmond	861 Brotherhood Bldg., Kansas City
Kentucky	Apr. 5-7, 1954	Louisville	A. B. Coxwell, Jr.	1976 Douglass Blvd., Louisville
Louisiana	Apr. 21-24, 1954	Baton Rouge	J. S. Bernhard	2515 Line Ave., Shreveport
Maine	June 28-30, 1954	Rockland	S. M. Gower	Box 27, Skowhegan
Maryland	May 3-5, 1954	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore
Massachusetts	May 2-5, 1954	Boston	H. E. Tingley	12 Bay State Road, Boston
Michigan	Apr. 25-28, 1954	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 22-24, 1954	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 5-8, 1954	Biloxi	B. A. Cohen	306 Plaza Bldg., Jackson
Missouri	June 13-16, 1954	St. Louis	E. D. Suggett	201 Merchants Bank Bldg., Jefferson City
Montana	May 6-8, 1954	Great Falls	E. G. Vedova	Roundup
Nebraska	May 10-12, 1954	Omaha	F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada	June 1954	Reno	O. M. Seifert	506 Humboldt St., Reno
New Hampshire	June 13-15, 1954	Whitefield	F. E. Williams	814 Elm St., Manchester
New Jersey	May 4-6, 1954	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 23-26, 1954	Santa Fe	J. S. Eilar	Medical Arts Square, Albuquerque
New York	May 10-12, 1954	Buffalo	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 16-19, 1954	Pinehurst	R. D. Coffey	Kibler Bldg., Morganton
North Dakota	May 23-25, 1954	Bismarck	V. B. Keltgen	517 de Lendrecie Bldg., Fargo
Ohio	Nov. 8-11	Columbus	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 25-28, 1954	Oklahoma City	D. Robertson	434 N.W. 13th St., Oklahoma City
Oregon	Mar. 1-3, 1954	Portland	W. H. Hurley	308 Selling Bldg., Portland
Panama Canal Zone	Dec. 8	Balboa	C. F. Atkins	DC, USA, Box 115, Rodman
Pennsylvania	Oct. 5-7, 1954	Pittsburgh	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico	Jan. 28-30, 1954	San Juan	F. Ordoñez	1558 Ponce de León Ave., Stop 23, Santurce
Rhode Island	Jan. 17, 19, 20, 1954	Providence	N. G. Migliaccio	1467 Westminster St., Providence

State	Date	Place	Secretary	Address
South Carolina		Columbia	J. R. Owings	7 Medical Court, Greenville
South Dakota	May 20-22, 1954	Sioux Falls	W. R. Stockstad	Sioux Falls
Tennessee	May 10-12, 1954	Chattanooga	W. L. McCulley	Brown Bldg., Cleveland
Texas	Apr. 25-29, 1954	Dallas	W. Ogle	3607 Gaston Ave., Dallas
Utah	Apr. 8-10, 1954	Salt Lake City	K. L. Dedekind	914 Medical Arts Bldg., Salt Lake City
Vermont	May 16-18, 1954	Woodstock	W. J. Reardon	18 Madison St., Rutland
Virginia	Apr. 12-14, 1954	Richmond	W. T. McAfee	705 Colonial National Bank Bldg., Roanoke
Washington	Mar. 25-27, 1954	Seattle	W. B. Martin	Medical-Dental Bldg., Seattle
West Virginia	July 25-28, 1954	White Sulphur Springs	G. N. Casto, Jr.	710½ Lee St., Charleston
Wisconsin	Apr. 20-22, 1954	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	June 20-23, 1954	Rock Springs	T. J. Drew	State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama	June 21-24, 1954	Birmingham	N. E. Allen	Du Bose Bldg., Selma
Alaska			P. H. Williams	Box 2123, Juneau
Arizona			R. K. Trueblood	107 East A Ave., Glendale
Arkansas			H. O. Weatherly	205 Halter Bldg., Conway
California	Feb. 8, 1954	San Francisco	K. I. Nesbitt	507 Polk St., San Francisco 2
	June 21, 1954	Los Angeles		
	July 26, 1954	San Francisco		
Colorado	June 21-25, 1954	Denver	C. K. Phillips	724 Republic Bldg., Denver 2
Connecticut	Nov. 9-14*†	Bridgeport	C. G. Brooks	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia			W. T. Birthright	1835 Eye St., N.W., Washington 6
Florida	July 12-22, 1954*†	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Georgia			S. H. Yarbrough	12 Medical Arts Bldg., Columbus
Hawaii			H. L. Houvenet	427 Dillingham Bldg., Honolulu
Idaho			R. E. Blickenstaff	1023 Fourth St., S., Nampa
Illinois			W. A. McKee	503 Wood Bldg., Benton
Indiana	Nov. 16-19*†	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa	May 24-28, 1954*†	Iowa City	D. J. FitzGerald	615 Brick & Tile Bldg., Mason City
Kansas	Jan. 18-21, 1954*†		G. L. Teall	Box 71, Hiawatha
Kentucky	June 7-10, 1954	Louisville	R. M. Justice	1330 Central Ave., Ashland
Louisiana			R. C. Steib	833 Maison Blanche Bldg., New Orleans
Maine			R. A. Derbyshire	Box 387, Skowhegan
Maryland	Nov. 2-4	Baltimore	H. Levin	3429 Park Heights Ave., Baltimore 15
Massachusetts	Nov. 30, Dec. 1	Boston	R. A. Barrette	Rm. 33, State House, Boston
Michigan	Jan. 24-30, 1954	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
	June 6-12, 1954			
Minnesota	Jan. 4-8, 1954	Minneapolis	M. G. Walls	1470 Lowry Medical Arts Bldg., St. Paul
	June 14-18, 1954			
Mississippi	Jan. 4-6, 1954	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
	June 15-17, 1954			
Missouri			R. R. Rhoades	414 Central Trust Bldg., Jefferson City
Montana			V. J. Quinn	301 Phoenix Bldg., Butte
Nebraska			H. E. Weber	1210 Federal Securities Bldg., Lincoln
Nevada	Dec. 7	Las Vegas	R. Whitehead	Suite 6, Masonic Temple, Reno
New Hampshire			D. J. Freese	4 Wall St., Concord
New Jersey	Nov. 30, Dec. 1*†	Philadelphia	W. A. Wilson	150 E. State St., Trenton 8
	Dec. 2-4*	Trenton		
New Mexico			J. J. Clarke, Sr.	Artesia
New York	Feb. 11, 1954†‡		D. W. Beier	23 S. Pearl St., Albany 7
	Feb. 11, 12, 1954*†‡			
	Feb. 16, 17, 1954†‡			
	Feb. 16-19, 1954*‡			
North Carolina	June 28-July 2, 1954	Chapel Hill	F. O. Alford	1109 Liberty Life Bldg., Charlotte 2
North Dakota	July 12-16, 1954	Fargo	A. L. Pushor	Lisbon
Ohio			H. B. Smith	336 E. State St., Columbus
Oklahoma			R. P. Keidel	403 Surety Bldg., Muskogee
Oregon	Dec. 7-10	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania			A. M. Stinson	Dept. of Public Instruction, Box 911, Harrisburg
Puerto Rico			J. Mercado C.	Box 3717, Santurce
Rhode Island	Nov. 24, 25	Providence	F. M. Hackett	267 Academy Ave., Providence
South Carolina			T. C. Sparks	1315 Pickens St., Columbia
South Dakota			H. T. Aker	Canton

State	Date	Place	Secretary	Address
Tennessee	Dec. 14§	Memphis	F. S. Maxey	804 Bennie Dillon Bldg., Nashville 3
Texas			R. T. Weber	312 Capital National Bank Bldg., Austin
Utah			E. O. Thompson	915 Medical Arts Bldg., Salt Lake City
Vermont			F. A. Reid	Windsor
Virginia			J. M. Hughes	715 Medical Arts Bldg., Richmond 19
Washington				
West Virginia			C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	Jan. 11-15, 1954*†	Milwaukee	S. F. Donovan	Tomah
Wyoming			W. A. Hocker	212 O & S Bldg., Casper

*Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations. §Approximate dates—verify with state dental examining board.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
Academy of Denture Prosthetics	Apr. 11, 1954	Miami Beach, Fla.	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
American Academy of Dental Medicine	Dec. 6	New York	W. M. Greenhut Secy.	124 E. 84th St., New York
American Academy of Implant Dentures	Feb. 7, 1954	Chicago	P. S. Loechler Secy.	1924 Thomas Lane, Augusta, Ga.
American Association for the Advancement of Science, Subsection on Dentistry	Dec. 29	Boston	R. W. Bunting Secy.	School of Dentistry, University of Michigan, Ann Arbor, Mich.
American Association of Orthodontists	May 16-20, 1954	Chicago	F. A. Squires Secy.	Medical Centre, White Plains, N. Y.
American Board of Orthodontics	May 11-15, 1954	Chicago	C. E. Martinek Secy.	661 Fisher Bldg., Detroit
Chicago Dental Society	Feb. 7-10, 1954	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Council on Dental Education, Dental Aptitude Tests	Mar. 5, 6, 1954		S. Peterson Secy.	222 E. Superior St., Chicago 11
Dallas Mid-Winter Dental Clinic	Jan. 24-27, 1954	Dallas	W. C. McCaskill, Jr. Chm.	1319 Medical Arts Bldg., Dallas, Texas
Denver Dental Association, Midwinter Meeting	Jan. 10-13, 1954	Denver	H. L. Harris Secy.	724 Republic Bldg., Denver
Detroit District Dental Society	Nov. 23, 24	Detroit	O. J. Fusilier Chm.	4421 Woodward Ave., Detroit
District of Columbia Dental Society Postgraduate Clinic	Mar. 14-17, 1954	Washington	Z. B. Lloyd Secy.	2007 R St., N.W., Washington
Great Lakes Society of Orthodontists	Nov. 2-4	Grand Rapids, Mich.	C. R. Anderson Secy.	402 Loraine Bldg., Grand Rapids, Mich.
Greater New York Dental Meeting	Dec. 7-11	New York	M. Purdy Exec. Secy.	Hotel Statler, Room 106A, New York
Greater Philadelphia Annual Meeting	Feb. 3-5, 1954	Philadelphia	R. Adams Secy.	337 Bellevue-Stratford Hotel, Broad and Walnut Sts., Philadelphia
Greater Pittsburgh Dental Meeting	Dec. 1-3	Pittsburgh	W. E. Craig Secy.	206 Jenkins Bldg., Pittsburgh
International Association for Dental Research	Mar. 19-21, 1954	French Lick, Ind.	E. H. Hatton Secy.	311 E. Chicago Ave., Chicago
Journées Dentaires de Paris	Nov. 24-29	Paris, France	R. Rolland Secy.-Gen.	15, Boulevard Malesherbes, Paris, France
Mexican Dental Association, Second International Dental Congress	Nov. 15-21	Mexico City, Mexico	R. M. Ruff Foreign Secy.	Asociacion Dental Mexicana, Insurgentes 257, Mexico City, Mexico
Mid-Continent Dental Congress	Nov. 16-18	St. Louis	J. E. Brophy Exec. Secy.	8013 Maryland Ave., St. Louis
National Board of Dental Examiners	Dec. 7, 8		G. J. Casey Secy.	222 E. Superior St., Chicago 11
New Orleans Dental Conference	Nov. 8-11	New Orleans	R. W. Irvine P. R. Chm.	1203 Maison Blanche Bldg., New Orleans
Southeastern Academy of Prosthodontics	Mar. 20, 21, 1954	Atlanta, Ga.	R. W. Durham, Secy.	1001 Bankers Insurance Bldg., Macon, Georgia
Southern Academy of Oral Surgery	Mar. 12-14, 1954	Savannah, Ga.	R. F. Sullivan Secy.	118 Jones St., E., Savannah, Ga.
Southern Society of Orthodontists	Nov. 1-4	Orlando, Fla.	M. D. Edwards Secy.	132 Adams Ave., Montgomery, Ala.
Southwestern Society of Orthodontists	Nov. 1-4	Little Rock, Ark.	F. Boyd Secy.	1502 N. Third, Abilene, Texas
Thomas P. Hinman Mid-Winter Clinic	Mar. 21-24, 1954	Atlanta, Ga.	S. Holbrook Exec. Secy.	15 Peachtree Place, N.W., Atlanta, Ga.

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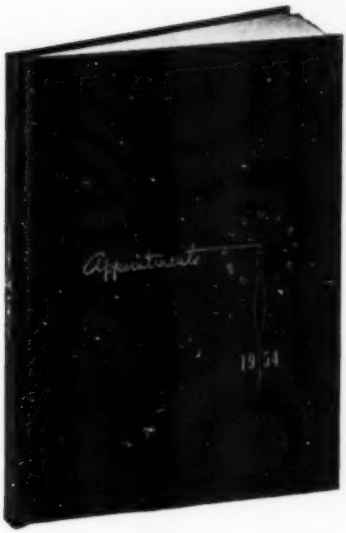

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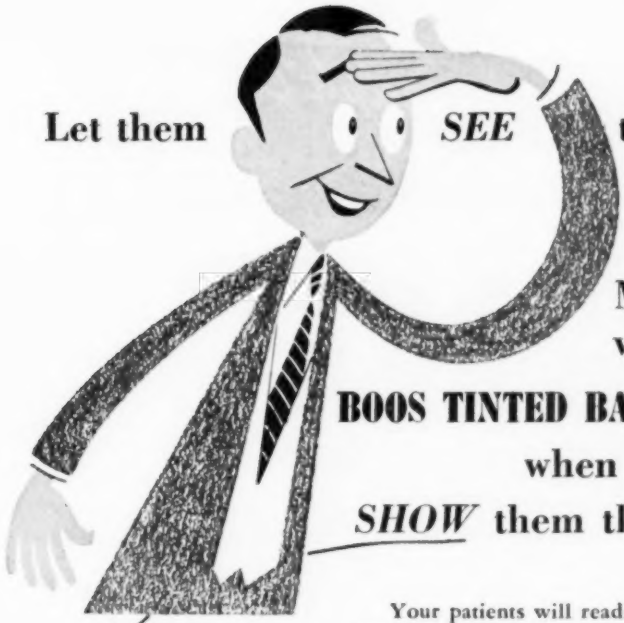

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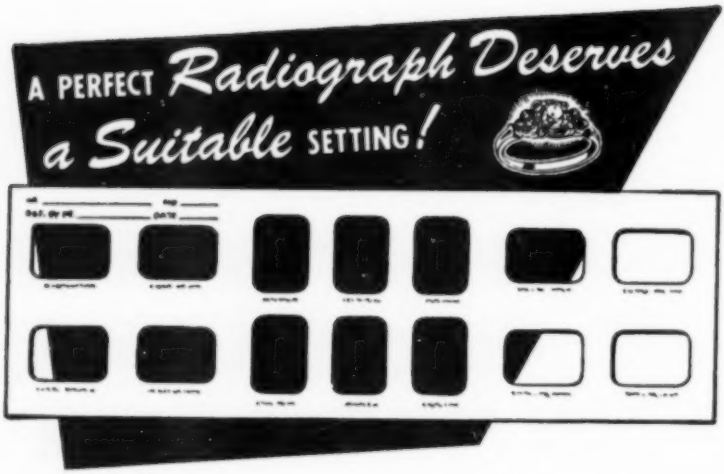

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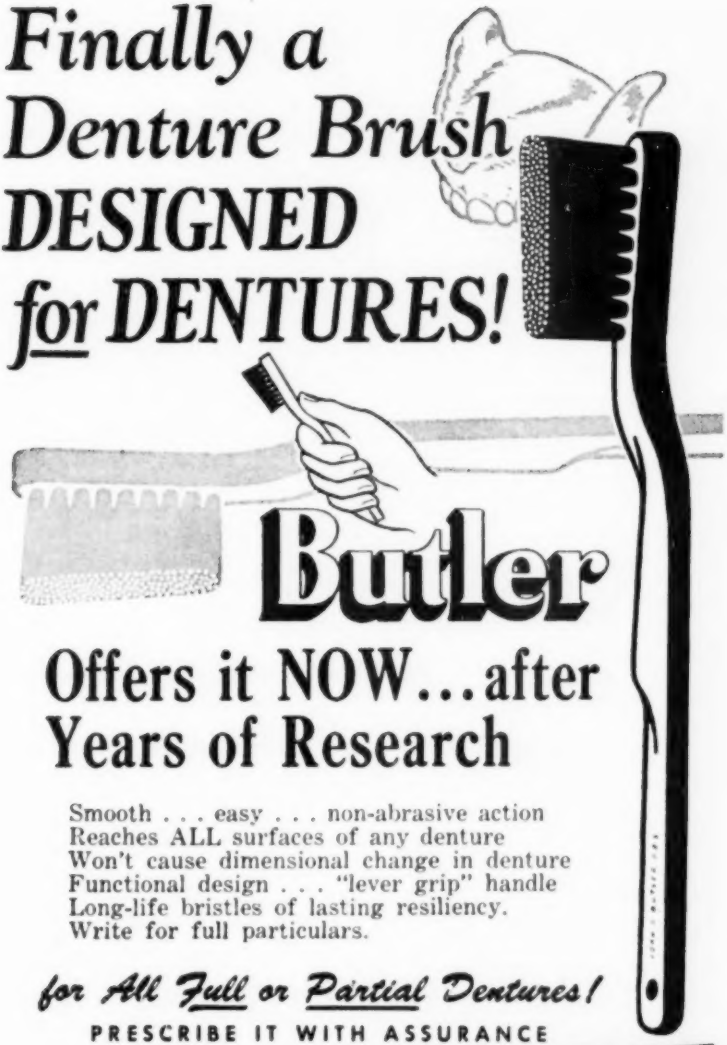

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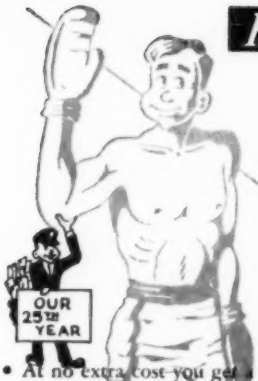

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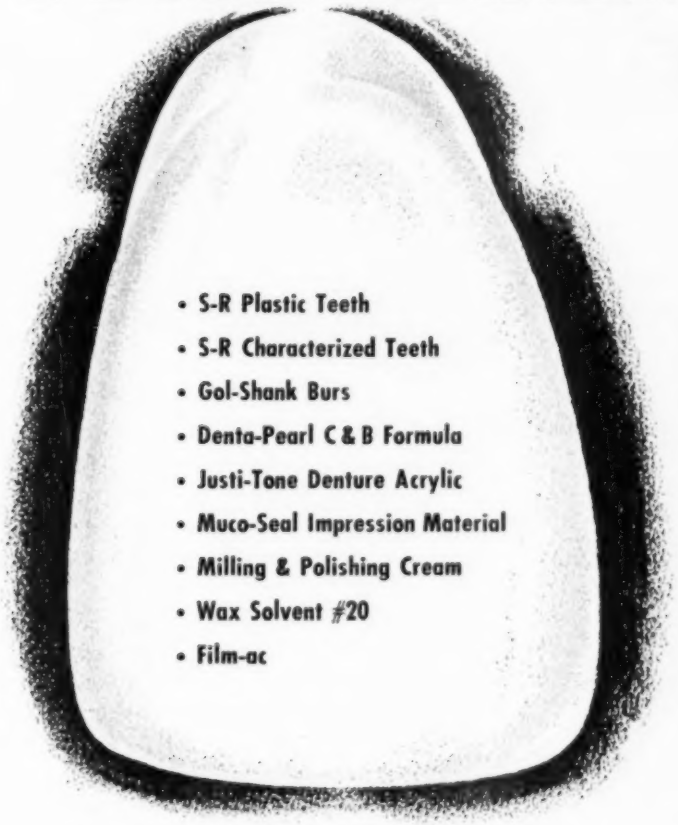
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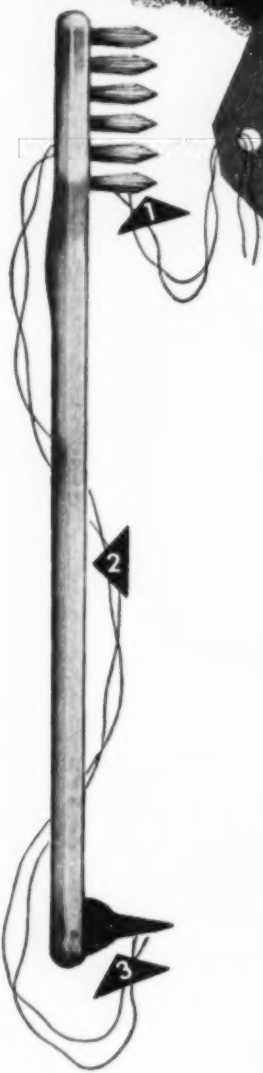

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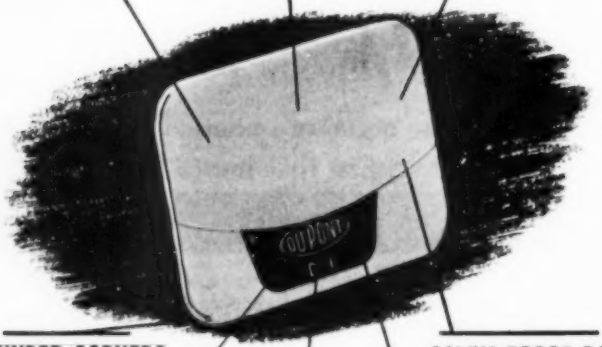

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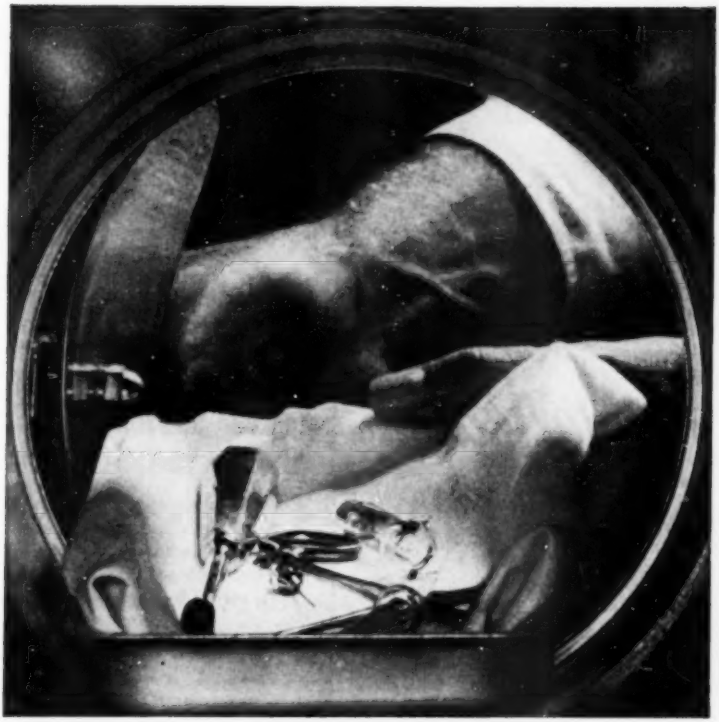

when you open this door . . .
that's the end of *hepatitis danger*

You can't tell when one of your patients carries a hepatitis-causing virus in his bloodstream—yet it takes just *one* to start cross-infection in your practice.

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And now *you* can use this safe, hospital-proved technique right in your office! At a price you can afford.

Castle's "777" Speed-Clave costs just $208![2]

Small enough to fit on a shelf, the "777" autoclaves cotton, and needles and instruments which enter the bloodstream—puts a sure end to hepatitis danger.

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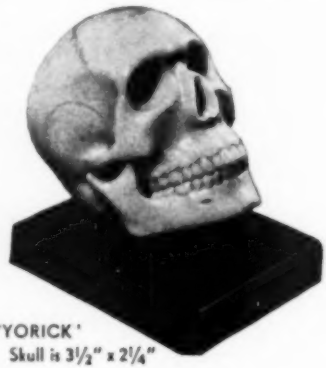

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Skull is 3½" x 2¼"

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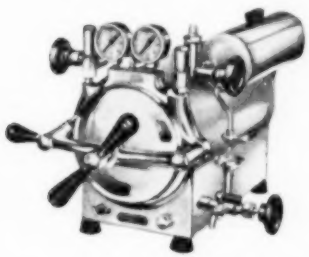

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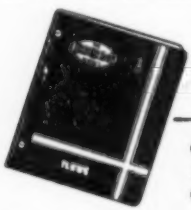

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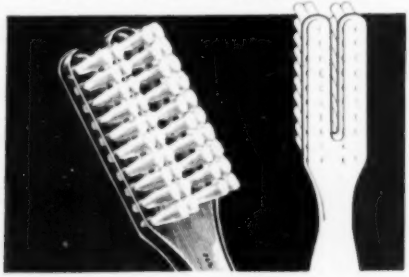

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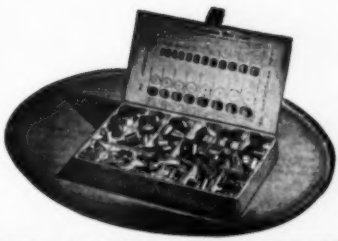

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Out of the Dark, a Red Grenade

Corporal
Duane Edgar Dewey, USMCR
Medal of Honor

IT WAS AN APRIL NIGHT and the Marines, near Panmunjom, were under heavy attack. In one of E Company's machine gun emplacements, Corporal Duane Dewey and his assistant gunner lay on the ground, wounded. A Navy Medical corpsman was giving them aid. Out of the darkness, and into the group, lobbed a live Red grenade.

Although he was already seriously wounded, and in intense pain, Corporal Dewey pulled the aid man to the ground, shouted a warning to the other Marine and threw himself over the missile.

"I've got it in my hip pocket, Doc!" he yelled. Then it exploded.

By smothering the blast with his own body, Corporal Dewey had saved his comrades' lives.

"Now that I'm back in civilian life," says Corporal Dewey, "I sometimes hear people talk as though stopping Communism is a job only for our armed forces and the government. Believe me, it's our job, too. And one way we can both do that job is through saving and investing in United States Defense Bonds."

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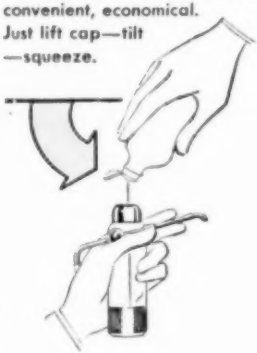

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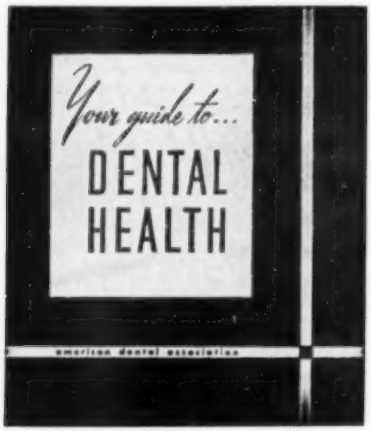

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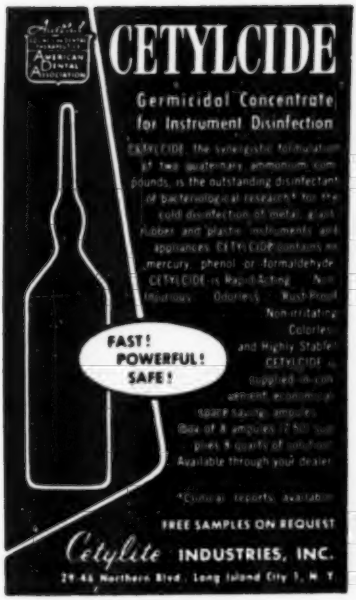
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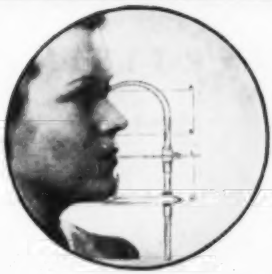

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FLORIDA—Dentists, white, licensed in Florida; one for Jackson County (Marianna); one for Dade County (Miami); and one for State Mobile Dental Unit. Starting salary $500. Liberal expense allowance for Mobile Unit. Excellent opportunities for promotion and salary increase. General retirement and leave provisions. Write Florida State Merit System. Director, W. V. Knott Building, Tallahassee, Fla.

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ILLINOIS—Chicago Civil Service Commission announces examinations December 5 for position of Chief of Dental Health Section, Chicago Board of Health. Salary $6,150.00. For information contact Civil Service Commission, 208 City Hall, Chicago, Ill.

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NEW YORK—Associate for general practice, percentage basis increasing each year. Guarantee yearly salary. Associate to retain all patients. Send full particulars in first letter. Upstate New York. Address A.D.A. Box No. 541.

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Dentist, experienced in diagnosis, minor oral surgery, and mouth rehabilitation, desires association with medical group or other dentist any section of New York State. Address A.D.A. Box No. 549.

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General practitioner 29 years of age, 5 years experience in all phases of dentistry; no specialist, but prefer pedodontia; will be draft exempt following discharge in December '53; looking for association with successful practitioner with possible purchase in mind; prefer rural area in central or upper New York. Direct replies to Major W. P. Luca, Jr., c/o Dr. W. P. Luca, Valley Stream, New York.

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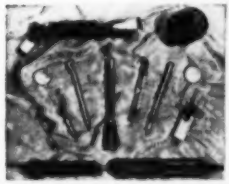

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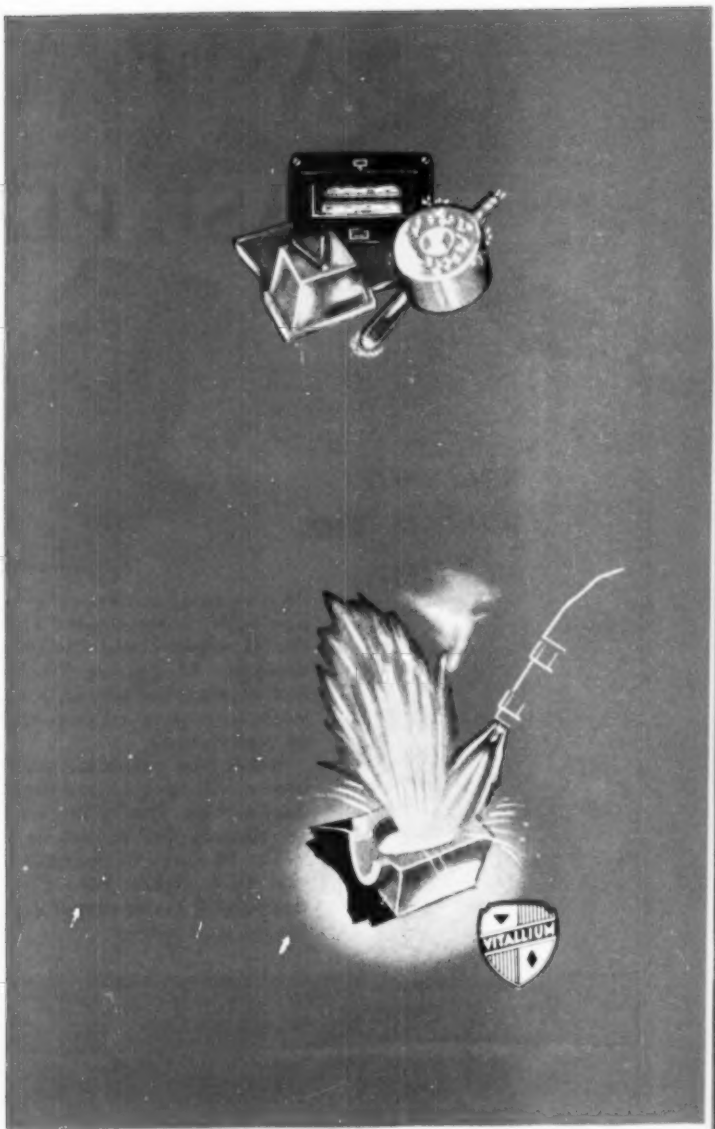
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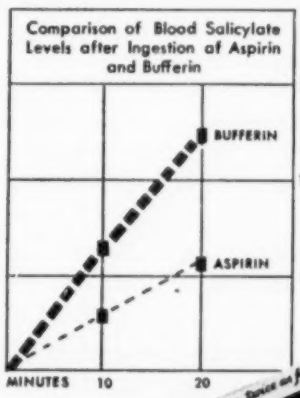

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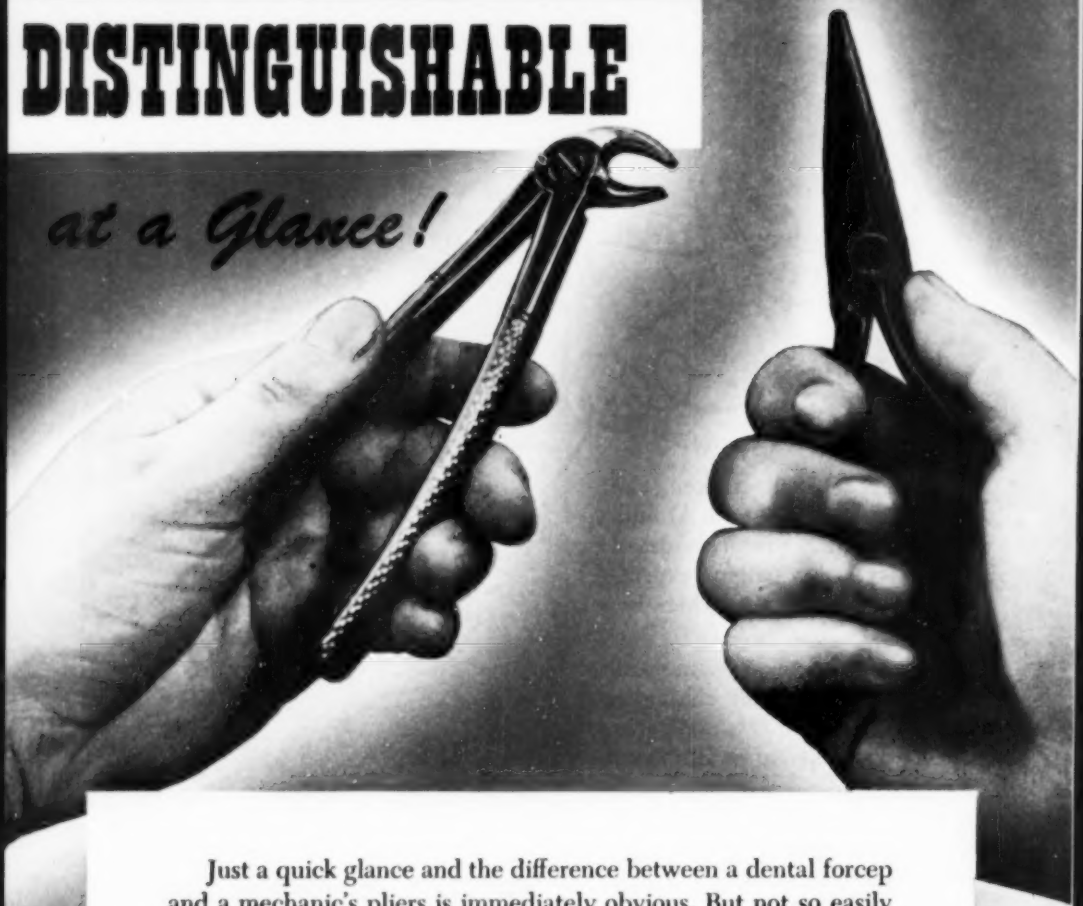

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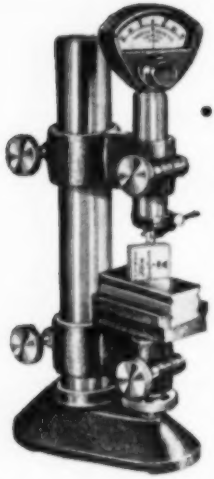

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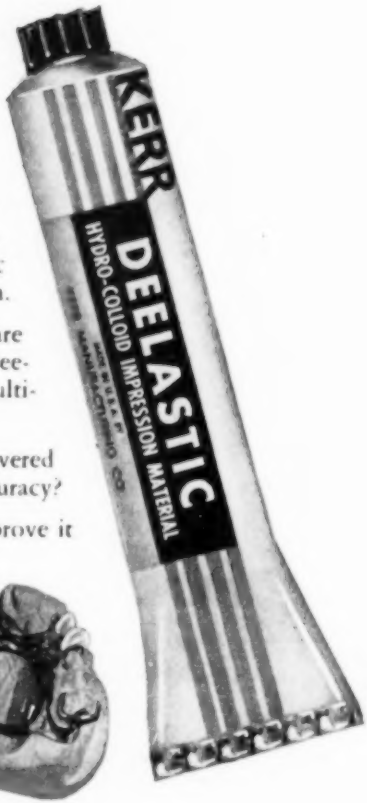

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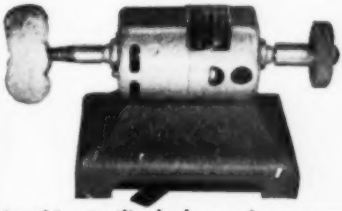

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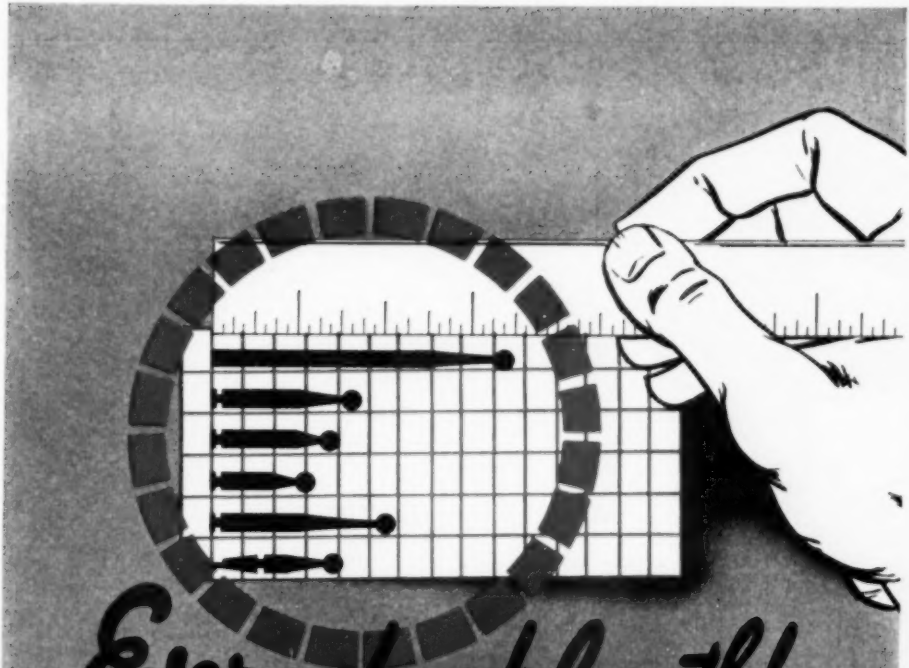

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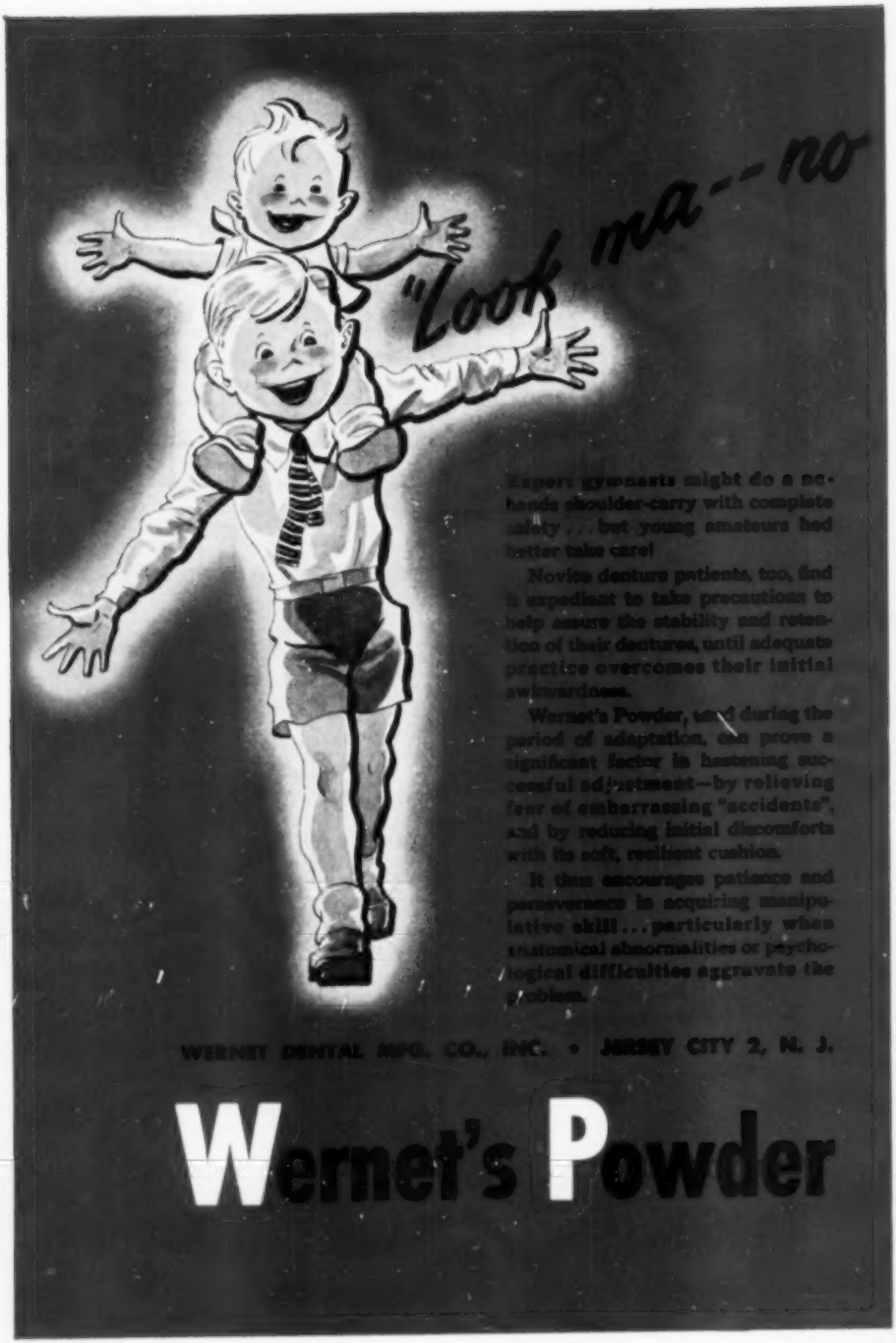
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NOVEMBER 1953

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• • •

Devices for facilitating the extraction of teeth have varied over the ages, from the ingenious and often ornate "turnkey", reputedly invented by Etienne Bourdet in 1753, to the lowly elastic band of our modern scientific era. Used principally with hemophiliacs, the band is placed around the tooth to be removed, and slowly works its way under the gum to the tip of the root — loosening the tooth, which eventually falls out without the loss of a single drop of blood! The procedure may take from four to two hundred days.

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Stranger than fiction is the famous "golden tooth" hoax of 1593. Givea a gold crown secretly, a Silesian boy of seven was "discovered" to have "erupted" a golden tooth—creating such an international sensation that, not only were seven or eight learned dissertations published, explaining the "miracle", but a new branch of medicine was created, known as "chrysodontoscopia"—the science of the golden tooth. However, after four years the gold cap wore thin, exposing the crown of the natural tooth . . . and the boy landed in prison.

• • •

Those who currently bemoan the "shortage" of dentists, and long for the "good old days", might be reassured by facts and figures: In Greater New York, for instance, as of fifty years ago there were only 2000 licensed dentists to serve a population of 5 million (1 dentist to 2500 pop.); whereas today's 8 million population are attended by some 3800 dentists (1 dentist to only 900 pop.).

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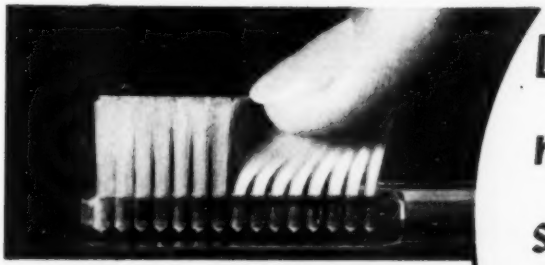

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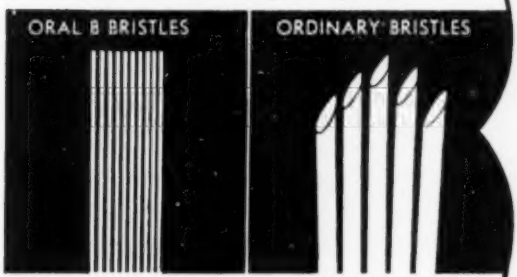

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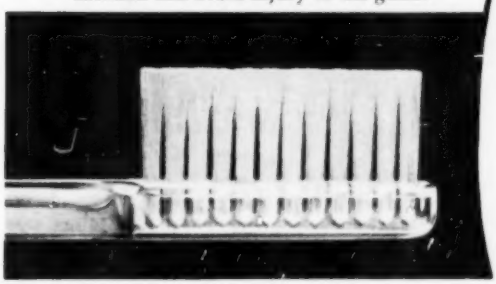

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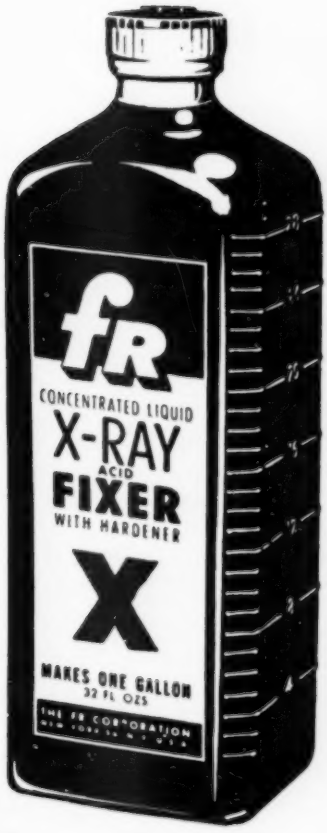

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